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ABSTRACT

To determine the effectiveness of a model driver education curriculum in leading to safe vehicle operation among beginning drivers, the Safe Peformance Curriculum, based on instructional objectives derived from analysis of the driver's tasks, was developed and pilot tested. Students were randomly assigned to one of the following: a Pre-Driver Licensing (PDL) course (instruction in the minimum requirements for a license), Safe Performance Curriculum (SPC), or a control group (no formal instruction). Intermediate criterion measures of performance, knowledge, skill, and attitude were administered to students in the first two groups. Program effects were measured in terms of curriculum (SPC versus PDL), sex and scholastic achievement level. Evaluation of knowledge and performance measures indicated a general trend toward higher scores by the SPC students, by students in the upper half of their class, and by male students. Recommendations are for further revision of the intermediate criterion measures and for a followup study. Appended material (158 pages) includes program test forms (with administration procedures and answers), SPC unit test results, basic skills range test analysis of variance source tables, and project staffing requirements. (Author/MS)

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Safe Performance Curriculum for Secondary School Driver Education:

Program Development, Implementation, and Technical Findings

Mary C. Riley and Robin S. McBride

Human Resources Research Organization

September 1974

FINAL REPORT

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16. Abstract

To determine the effectiveness of a model driver education curriculum in leading to safe vehicle operation among beginning drivers, the Safe Performance Curriculum was developed and pilot tested. The curriculum was based on instructional objectives derived from an analysis of the driver's tasks. In the pilot test, students were randomly assigned to one of the following: (a) Safe Performance Curriculum (SPC); (b) a Pre-Driver Licensing (PDL) course, consisting of instruction in the minimum requirements needed for the granting of a driver's license; or (c) a control group, which received no formal instruction through the secondary school system. Intermediate criterion measures of performance, knowledge, skill and attitude were administered to students in the first two groups. Program effects were measured in terms of curriculum (SPC vs. PDL), sex, and scholastic achievement level (lower vs. upper half of class). Evaluation of knowledge and performance measures indicated a general trend toward higher scores by the SPC students, by students in the upper half of their class, and by male students. Recommendations are for further revision and refinement of the intermediate criterion measures and for a follow-up study using a more controlled experimental design and a larger number of subjects.

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PREFACE

The objective of the study described in this report was to determine the effectiveness of a model driver education curriculum in leading to safe vehicle operation among high school students beginning to drive. To meet this objective, a driver education course, referred to as the Safe Performance Curriculum, was developed and pilot tested.

This report describes the research program for the Safe Performance Curriculum and the results of the intermediate criterion measures administered as a part of the pilot test, which was conducted in the Kansas City, Missouri School System during the Summer and Fall, 1973, and Spring, 1974. The report describes the background and organization of the curriculum, the operational aspects of the pilot test implementation, the intermediate criterion measures, content acquisition, and participant reaction to the program.

The curriculum is based on several previous driver education projects developed by the Human Resources Research Organization for the National Highway Traffic Safety Administration, U.S. Department of Transportation, and described in the following reports: *Driver Education Task Analysis, Volume I: Task Descriptions*, DOT HS 800 367, (HumRRO Technical Report 70-103), which provides an inventory of the driving tasks; *Driver Education Task Analysis, Volume II: Task Analysis Methods*, DOT HS 800 368, (HumRRO Technical Report 72-13), which describes the background of the task analysis study and methods used in carrying out the analysis; *Driver Education Task Analysis, Volume III: Instructional Objectives*, DOT HS 800 369, (HumRRO Technical Report 71-9), which deals with the performance and enabling objectives and the evaluation instrument which resulted from the task analysis; and *Driver Education Task Analysis, Volume IV: Development of Instructional Objectives*, DOT HS 800 370, (HumRRO Technical Report 72-14), which describes the methods used in developing the instructional objectives.

A companion report to this document on the Safe Performance Curriculum was prepared by HumRRO for the National Highway Traffic Safety Administration under this same contract and is entitled *Driver Education Curriculums for Secondary Schools: User Guidelines*, HumRRO Final Report ED-74-3, September 1974; it includes three auxiliary sections—*Safe Performance Curriculum, Instructor Guidance Materials; Safe Performance Curriculum, Student Materials;* and *Pre-Driver Licensing Course, Instructor Guidance Materials.*

The work described here was performed by HumRRO's Eastern Division, Alexandria, Virginia, Dr. J. Daniel Lyons, Director, as the prime contractor, and by Central Missouri State University, Warrensburg, Missouri, as the subcontractor. This report has been designated HumRRO Technical Report 74-23. The project was sponsored by the National Highway Traffic Safety Administration, under Contract No. DOT-HS-003-2-427. Acknowledgments for this project are made on the following pages.

Meredith P. Crawford
President
Human Resources Research Organization

ACKNOWLEDGMENTS

Appreciation is extended to the many individuals and agencies who contributed to this project.

Special recognition is given to the pilot test instructors: Ms. Elaine R. Axton, Mr. James Brown, Mr. Dan Carder, Mr. Michael Chatron, Ms. Linda Cooley, Mr. John Howland, Mr. Gerald Hunton, Mr. John Montgomery, and Mr. Michael Wingate. Mr. Durward Faries served as the on-site curriculum administrator throughout the project implementation, and Ms. Ann Toledo served as the on-site project director in the Spring, 1974 semester. All on-site personnel were employees of the Central Missouri State University (CMSU).

Several Principal Investigators were responsible for the study effort throughout the various phases of the project. Dr. A. James McKnight served as HumRRO Principal Investigator throughout the development stages of the project and as CMSU Principal Investigator during the Summer, 1973 pilot test. He now serves as Director of the National Public Services Research Institute (NPSRI), research arm of CMSU, located in Alexandria, Virginia. Dr. Alan G. Hundt served as HumRRO Principal Investigator during the Fall, 1973 pilot test and most of the Spring, 1974 pilot test. Dr. James D. Tschechtelin participated in curriculum development activities as an employee of HumRRO and served as CMSU Principal Investigator as an employee of NPSRI during the Fall, 1973 pilot test. Mr. Robin S. McBride directed the evaluation effort as HumRRO Principal Investigator.

Special appreciation is extended to Dr. Kenard McPherson, NHTSA Contract Technical Manager (CTM) throughout the curriculum development and implementation stages of the project, for his insightful comments and suggestions to improve the curriculum, and for his support throughout its implementation. Dr. McPherson served as NHTSA CTM as a driver education specialist for the State of Washington on temporary assignment to NHTSA, under the auspices of the Inter-Governmental Personnel Act of 1970.

Appreciation is also extended to Dr. John Eberhard, Head, Driver Education and Licensing Group, NHTSA, who provided overall direction to the project; and to Mr. Herbert R. Miller, who served as NHTSA CTM during the evaluation phase of the project.

On-site implementation efforts were coordinated by staff members of the School of Public Services, Central Missouri State University. They include: Dr. Robert L. Marshall, Dean, School of Public Services; Dr. Robert Ulrich and Dr. James Counts, who served as instructor training consultants to the project; Dr. Robert Baldwin, Director, Special Services, and Dr. Richard Tossell, Assistant Director, School of Public Services. Dr. Willard North and his staff at CMSU were responsible for computer processing and analysis of the data.

Ms. Mary Riley, HumRRO, was primarily responsible for the development and refinement of Instructor Guidance Packages and Administrative Guidelines throughout all phases of the project. Ms. Deborah Bercini, HumRRO, was responsible for the revision of all knowledge measures.

Special thanks are extended to Mr. Lawrence Bates of the Kansas City School System, who was instrumental in securing cooperation from pilot test schools and in providing general administrative guidance for the conduct of the implementation; and to Dr. Gordan Wesner and Mr. Robert MacNevan for the support which the Kansas City, Missouri School District provided to the project.

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Gratitude is also extended to the project advisory panel for its assistance, from general guidance to direct participation, in carrying out the activities of the project. Panel members included Dr. Wallace Berger, University of Michigan; Dr. Richard Bishop, Florida State University; Dr. Alphonse Chapanis, Johns Hopkins University; Dr. Margaret H. Jones, University of California; Dr. Richard Pain, URS Matrix; Mr. Harris Shettel, American Institute for Research; Dr. Lee Tack, Iowa Department of Public Instruction; and Dr. Thomas Rockwell, Ohio State University.

Appreciation is also extended to the following individuals and manufacturers who contributed services, materials, and equipment to the project: Mrs. June Cunningham who, as a HumRRO employee in the early stages of the project, participated in the development of specifications and instructional objectives and, as an employee of Ginn and Company, was responsible for the development of all student materials used in the pilot test; Ginn and Company, textbook publishers, which supplied the student materials in sufficient quantity for pilot testing in the Summer and Fall, 1973 semesters; Mr. James Kelly, Visual Educom, who directed the research staff to available instructional media; Visual Educom, which supplied one simulator and three multimedia stations for use in the pilot test; AEtna Life and Casualty, which supplied films, filmstrips and audio tapes; Doran Precision (formerly Allstate), which supplied films; Singer Simulation Systems, which supplied two simulators; Ford Motor Company, which provided filmstrips and records; General Motors, which provided films; Oldsmobile and Chevrolet dealers in the Kansas City area, who through the auspices of the Missouri Automobile Dealers Association, supplied the vehicles for the project; and the Kansas City Royals and Chiefs, who permitted the use of the Kansas City Sports Complex lot for evasive range exercises.

BACKGROUND

Despite the many attempts that have been made to assess the value of formal driver education in teaching safe vehicle operation, there is little evidence supporting the effectiveness of driver education. The nature and inadequacies of previous investigations are well documented in the series of five driver education evaluation reports that initiated the present research program in driver performance.

Major deficiencies in previous studies have been the lack of an explicit description of what constitutes "good" driving, and a lack of adequate experimental design and methods to measure the effectiveness of the programs. These studies concluded that a necessary step in both the development and evaluation of sound driver education programs is an analysis of the driver's tasks. In four studies sponsored by the National Highway Traffic Safety Administration and undertaken by the Human Resources Research Organization, a comprehensive analysis of the driver's task was conducted in order to identify critical driving behaviors; instructional objectives derived from the task analysis were then developed.

OBJECTIVE AND APPROACH

In the study described here, the objective was to determine the effectiveness of a model driver education curriculum in leading to safe vehicle operation among beginning drivers. To meet this objective, a curriculum, referred to as the Safe Performance Curriculum, was developed and pilot tested. The curriculum was based on the instructional objectives derived from the Task Analysis. The pilot test represents the first step in a full-scale evaluation of the effectiveness of driver education in leading to safe vehicle operation. Although originally intended as part of the curriculum evaluation, long-term follow-up measures (accidents and violations) were not obtained because sample sizes were smaller than anticipated and because a relatively small percentage of students participating in the program obtained a driver's license.

The results of the intermediate criterion measures administered as a part of the pilot test are presented in this report. In addition, the curriculum development process and the operational aspects of the pilot test implementation are described. Instructional materials developed under this study and guidelines for curriculum implementation are provided in a companion report, *Driver Education Curriculums for Secondary Schools, User Guidelines*.

This study was sponsored by the National Highway Traffic Safety Administration and was carried out by the Human Resources Research Organization as prime contractor, and the Central Missouri State University in Warrensburg as subcontractor.

EVALUATION OF PROGRAM EFFECTIVENESS

The pilot program was conducted in the Kansas City, Missouri School System, where driver education is not a state requirement. The implementation took place in three high schools where driver education was not previously offered. Students who volunteered for the program were randomly assigned to one of the following: (a) the Safe Performance Curriculum, a comprehensive safe driving-oriented course derived from the Task Analysis;

(b) a Pre-Driver Licensing course, consisting of instruction in the minimum requirements needed for the granting of a driver's license; (c) a control group, which received no formal instruction through the secondary school system. In spite of random assignment of subjects to groups, some biases in pre-training ability levels were found, necessitating the use of analysis of covariance procedures in analyzing results of intermediate criterion measures.

PROGRAM IMPLEMENTATION

Difficulties experienced throughout the implementation phases of the project included maintaining control over random assignment of students to groups, delays in scheduling, inadequate instructor preparation, and the lack of a clear delineation of responsibility at the administrative levels. Implementation problems are discussed in detail in this report, and recommendations for dealing with these problems in future efforts are made.

INTERMEDIATE CRITERIA EVALUATION

The performance of students in the two curricula, SPC and PDL, was compared on various tests designed to measure knowledge, skills, and attitudes. These tests (intermediate criteria) included written Knowledge and Unit Tests to measure informational content acquisition, Range and On-Road Performance Tests, Perceptual Skills Test, and an Attitude Measure. The SPC group received some additional testing in content areas not covered by the PDL curriculum. Program effects were measured in terms of curriculum (SPC vs. PDL), scholastic achievement level of the students (lower vs. upper half of class), and sex.

Evaluation of knowledge and performance measures indicated a general trend toward higher scores by the SPC students, by students in the upper half of their class, and by male students. However, knowledge test scores were low for all groups, ranging from 60% to 69%. Few conclusions have been drawn from the Perceptual Skills Test, because of that instrument's extremely low reliability. The Attitude Measure, although still a very unrefined instrument, seemed to show a trend toward more realistic and less overcautious responses after training, particularly by the SPC students.

To provide a summary on the status of the measures, the Knowledge and Unit Tests have satisfactory reliability, but require standardization to obtain a better estimate of relative difficulty levels. The Attitude Measure shows promise but needs further validation. The Perceptual Skills Test is of little utility and requires major changes in administration procedures. Modifications are recommended for the On-Road Performance Test in order to simplify scoring procedures.

PARTICIPANT FEEDBACK

To identify areas for future improvement, students, instructors, and driver education training consultants were asked to comment on various aspects of the project. Consultants most frequently mentioned the need for selecting more highly trained instructors, or providing a more intensive instructor training program. The instructors generally commented on the poor quality of slide and film presentations, and the need to provide greater motivation for the students in the area of independent study. The students often complained of boredom, and asked for less classroom work and more on-road training.

RECOMMENDATIONS

The changes indicated by the opinions expressed in the preceding paragraph are recommended. Further revision and refinement of the intermediate criterion measures are also recommended until all tests are proven reliable, valid, standardized, and free of administration problems. In addition, a follow-up study is indicated, using a more controlled experimental design and a larger number of subjects, so that a longer program evaluation, using accidents and violation criteria, could be accomplished. Finally, it is recommended that the problems associated with the pilot implementation be studied and the recommendations set forth in this document be incorporated in future efforts.

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Safe Performance Curriculum for Secondary School Driver Education:

Program Development, Implementation, and Technical Findings

INTRODUCTION

BACKGROUND OF THE SECONDARY SCHOOL DRIVER EDUCATION PROJECT

Historically, the Secondary School Driver and Traffic Safety Education Project is traceable to three sources: the National Highway Safety Act of 1966, which is the legislative basis for work performed under this contract; findings of four separate studies[1,2,3,4] stemming from the 1966 legislation; and follow-on recommendations of a fifth study.[5]

In 1967, the National Highway Safety Bureau, now the National Highway Traffic Safety Administration (NHTSA), contracted with four independent organizations for a study of driver education and recommendations for programmatic action. The following year, the Highway Research Board assumed the task of synthesizing the conclusions arrived at by the four contractors and recommending a single plan of action that would result in an empirical evaluation of driver education and the development of demonstrably effective training methods.

The long-term recommendations of the Highway Research Board, which are most relevant as background to this project, include the following five components: (a) development of driver performance measures, (b) identification of meaningful, real-world driving performance criteria, (c) conduct of research studies relating intermediate driver performance measures to terminal performance objectives with real-world driving performance criteria, (d) development and modification of driver training programs, and (e) conduct of overall evaluations of driver education and training programs.

In pursuit of these objectives, a contract to analyze the driving task and to develop instructional objectives (including performance, knowledge, and skill objectives) was

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[1] Robert L. Chapman and Paul B. Carpenter. *Driver Education and Training Project for the National Highway Safety Bureau*, Final Report, Institute for Educational Development, El Segundo, California, June 1968.

[2] New York University, Center for Safety. *Driver Education and Training—Plans for Evaluating the Effectiveness of Programs*, May 1968.

[3] Dunlap and Associates, Inc. *Driver Education and Training*, Final Report, prepared by Dunlap and Associates, Darien, Connecticut, May 1968.

[4] William A. Lybrand, *et al. A Study on Evaluation of Driver Education*, American University, Washington, July 1968.

[5] Harry H. Harman, *et al. Evaluation of Driver Education and Training Programs*, Highway Research Board, National Academy of Sciences, May 1969.

awarded to the Human Resources Research Organization (HumRRO) by NHTSA (Contract FH11-7336).[1,2,3,4] The results of this project, completed in February 1971, included:

(1) An inventory of more than 1700 specific behaviors required of drivers.
(2) Numerical values representing the criticality of each behavior to highway safety.
(3) An inventory of performance, knowledge, and skill objectives for secondary school driver education.

The purpose in preparing the 1700 behaviors or task descriptions was to identify a set of driver performances that could be employed as objectives in the development of driver education courses. The task descriptions themselves do not, in any sense, represent instructional material. Rather, they are technical data to be used in the preparation of appropriate instructional materials.

The numerical values assigned to each behavior, referred to as "criticality indices," represent the results of a process by which a group of 100 authorities in the field of highway safety rated behaviors in terms of their criticality to the highway transportation system. The rating process is described in *Driver Education Task Analysis, Volume II: Task Analysis Methods* (7). Each numerical value represents the average of the ratings assigned by five (in some cases, four) of the evaluators. The values range from -20 (least critical) to +20 (most critical) with a mean of zero[5] and a standard deviation of 10.

The following task is presented as an example: "If distance does not permit an emergency stop, the driver will look for space on the roadway to take evasive action." This task was assigned a criticality rating of 15.

Once a systematic analysis was made of the driver's many tasks and a criticality rating was assigned to each task, a set of performance, knowledge, and skill objectives was derived from the analysis. Using the previous example—". . . the driver will look for space on the roadway to take evasive action"—the instructional objectives derived from this task and its behavioral components state: "The student will be able to select appropriate alternate path(s) of travel when the intended immediate path is either blocked by a stationary object or is in imminent danger of being blocked by an object in motion." The objectives also list the criteria the student should follow in selecting an alternate path of travel and, finally, the procedures involved in "controlling the car" in this situation.

Once the instructional objectives were developed, specifications[6] for a driver education curriculum, referred to as the Safe Performance Curriculum (SPC), were prepared.

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[1] A. James McKnight and Bert B. Adams. *Driver Education Task Analysis, Volume I: Task Descriptions*, U.S. Department of Transportation, HS 800 367 (HumRRO Technical Report 70-103), November 1970.

[2] A. James McKnight and Bert B. Adams. *Driver Education Task Analysis, Volume II: Task Analysis Methods*, U.S. Department of Transportation, HS 800 368 (HumRRO Technical Report 72-13), April 1972.

[3] A. James McKnight and Alan G. Hundt. *Driver Education Task Analysis, Volume III: Instructional Objectives*, U.S. Department of Transportation, HS 800 369 (HumRRO Technical Report 71-9), March 1971.

[4] A. James McKnight and Alan G. Hundt. *Driver Education Task Analysis, Volume IV: The Development of Instructional Objectives*, U.S. Department of Transportation, HS 800 370 (HumRRO Technical Report 72-14), March 1971.

[5] The values are actually taken from standard scores which range from -2.0 to +2.0. The decimal point was eliminated for the sake of simplicity.

[6] Human Resources Research Organization. "Safe Performance Curriculum Interim Specifications," prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. HS-003-2-427, 1973.

The specifications were developed by HumRRO in cooperation with several other agencies and individuals identified in the Acknowledgements section of this report. Persons with expertise in the field of driver education developed specifications for each unit of instruction. (The unit breakdown is presented in Chapter 2.) The specifications were then reviewed by approximately 50 driver educators and other interested parties. In addition, about 75 attendees of the 1972 National Safety Congress participated in four workshops concerned with the design of the instructional modules. (A detailed description of the specifications development process and their use in preparing instructional materials is presented in Chapter 1.)

PURPOSE FOR DEVELOPING AND EVALUATING THE SAFE PERFORMANCE CURRICULUM

The purpose in developing and evaluating the Safe Performance Curriculum was to determine whether a secondary school driver education curriculum, based upon the requirements for safe driving performance (enumerated in the Task Analysis), is effective in reducing accident involvement. In this project, then, the Safe Performance Curriculum was based on the instructional objectives derived from the Task Analysis and was in accordance with the specifications just discussed. The Curriculum was then pilot-tested in the Kansas City, Missouri school system over three semesters—Summer and Fall, 1973 and Spring, 1974.[1]

The nature and inadequacies of previous investigations of formal driver education are well-documented in the series of five driver education evaluation reports mentioned earlier that initiated the present long-range research program in driver performance.

A major barrier to a conclusive evaluation in previous studies has been the difficulty in exercising control over who receives formal driver education and who does not. Without such controls, there is no way of knowing whether the apparently safer traffic record of driver education students is due to the formal program of instruction or the manner in which students are selected—that is, whether driver education tends to make safer drivers or whether potentially safer drivers tend to take driver education.

A second major deficiency in previous studies has been the nature of the driver education programs evaluated. The term "driver education" covers a variety of programs representing widely varying objectives, levels of effort, and quality. Consequently, attempts to evaluate the effectiveness of driver education from a safety viewpoint should start by assembling or identifying a program that is specifically oriented to the development of safe driving behaviors. It is this goal that the Safe Performance Curriculum attempts to achieve.

The curriculum, then, is a vehicle in a research study; it was not intended to be an end product in itself. To be an effective research vehicle, the curriculum was developed in such a way that it represented the best that the driver education community and its supporting scientific and technical resources had to offer as an accident countermeasure. Any instructional content, method, or material that appeared capable of leading to accident reduction was utilized. The desire to produce the "most effective possible" curriculum led to the inclusion of some material whose contribution may not be equal to its cost. The primary goal of the project, however, was not to design the most cost-effective approach, but to include materials that would lead to the attainment of all the course objectives.

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[1] The State of Missouri was selected as a pilot site because it was a state that does not provide a program of driver education supported under State or Federal funds. As a result, a number of schools in Missouri do not [illegible] driver education. This situation was desirable for the purposes of this study, since it was better to administer driver education to a group of students who normally would not receive it than it would have been to withhold it from a group who was entitled to it.

A study designed to establish the most cost-effective approach to driver education would require the experimental evaluation of various alternative curricula. Such a study would be large, complex, and lengthy, and is not likely to be undertaken until there is some tangible evidence that driver education in any form is effective. This is why the initial effort in this study was directed toward the development of the most effective possible curriculum. Should a study be undertaken to determine the most "cost-effective" approach to driver education, it is possible that certain elements of the current program could be deleted without reducing its effectiveness.

In response to the need to exercise some control over who received the treatment (curriculum) and who did not, the students in the pilot test were assigned on a random basis to one of the following: (a) the Safe Performance Curriculum (SPC), (b) a Pre-Driver Licensing (PDL) course consisting of instruction in the minimum essentials (knowledges and skills) required for the granting of a motor vehicle operator's license, or (c) no formal program of driver education through the secondary school system. (See Figure 1.) It was originally intended that a long-range, accident follow-up study would be made of subjects in all three groups. However, due to restrictions in sample size, the follow-up study is not being made. (Problems experienced in acquiring an adequate sample size are discussed in detail in Chapter 3.)

The findings presented in this report reflect only the results of intermediate criterion measures (short-term tests of knowledge and performance administered during the program of instruction) administered to students in the Safe Performance Curriculum and the Pre-Driver Licensing Course. It was never intended that students in the "no formal instruction" group would be administered intermediate criterion measures since test administration may have provided an indirect form of instruction.

The three groups were divided by class standing (upper/lower half of class) and sex. The effectiveness of each form of instruction was determined through administration of knowledge and performance measures to students in the Safe Performance Curriculum and the Pre-Driver Licensing course. Test results for these measures are presented in Chapter 5 of this report.

SAFE PERFORMANCE CURRICULUM PILOT TEST

Research Design

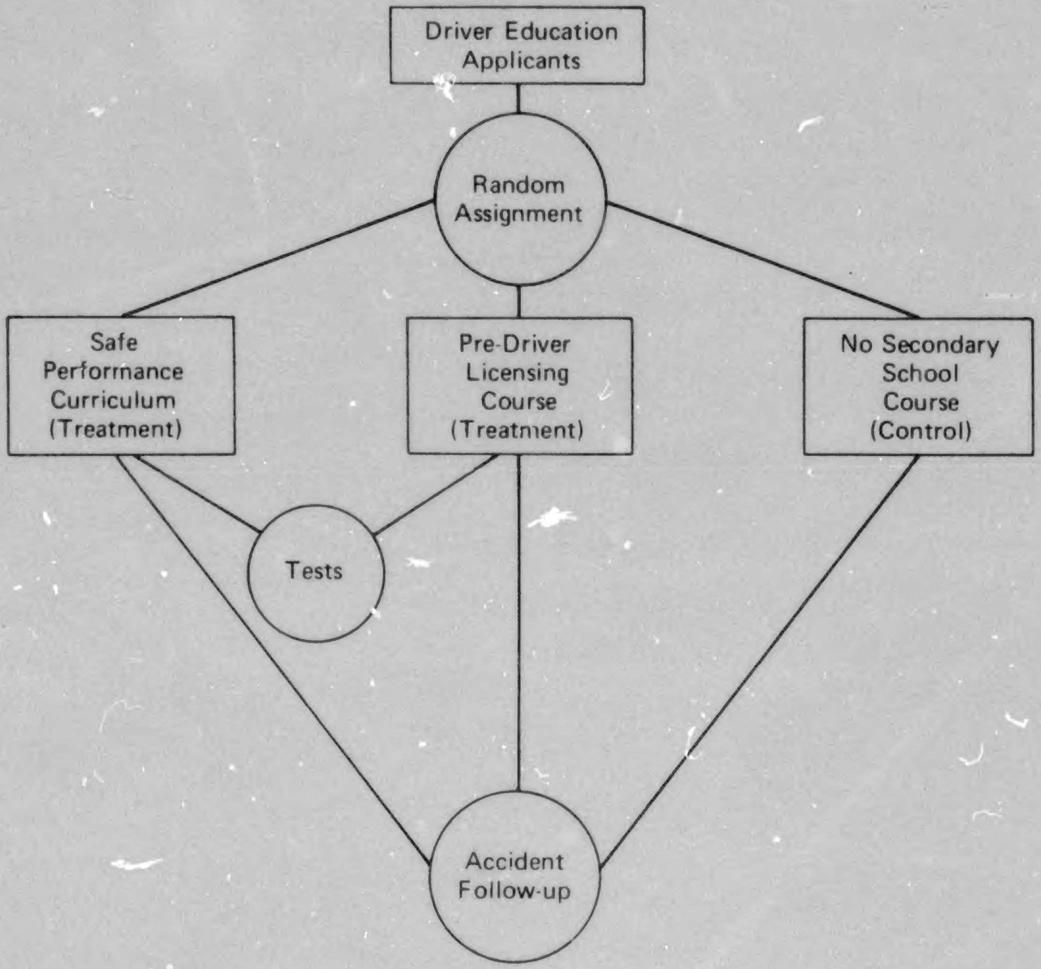
Driver Education Applicants
Random Assignment
Safe Performance Curriculum (Treatment)
Pre-Driver Licensing Course (Treatment)
No Secondary School Course (Control)
Tests
Accident Follow-up

Figure 1

Chapter 1

DEVELOPMENT OF SAFE PERFORMANCE CURRICULUM

CURRICULUM MATERIALS

The specifications discussed in the Introduction served as the basis for the development of materials for the Safe Performance Curriculum. The materials included:

- Student materials
    - Instructional materials
    - Practice materials
    - Alternative materials
- Instructor materials
    - Guidance materials (general and specific)
    - Instructional aids
        - Student evaluation materials
- Equipment
- Instructional devices
- Instructional facilities

The specifications did not attempt to describe the *specific* characteristics of the curriculum materials. Rather, they sought to identify what the materials must be capable of accomplishing—that is, to describe their *functional* characteristics. For example, the specifications for student materials dealing with "evasive maneuvers" state that these materials should "concentrate on the selection of appropriate alternate paths of travel, the need for which has been induced by unexpected behaviors or conditions. Emphasis must be directed to the fact that time for normal information processing and decision making is extremely limited." Student materials developed from this specification present driving situations requiring an emergency evasive response, and students are asked how they would respond. A "Fact Sheet," which follows each situation, explains the correct response by describing the procedural components of the skills required to react to the situation. Those objectives with high criticality ratings are given the greatest emphasis.

The specifications for the instructor materials (which include descriptions of classroom, simulation, range, and on-street activities, call for:

(1) A *review* of the concepts introduced through the student materials. (This specification is met in the classroom, where students view and discuss a 16mm film dealing with emergency situations.)

(2) Exercises in which students *respond* to visually-depicted emergency situations. (This is handled in simulation.)

(3) Behind-the-wheel instruction providing those *experiences* designed to prepare the student to respond to situations calling for emergency evasive action and appropriate methods of performance. (This is handled in a "blocked lane" exercise on the range.)

The purpose in preparing curriculum specifications prior to development of course materials was to:

- Allow representatives of the secondary school driver education community to review requirements and supply comments as well as materials that would meet the needs of the Safe Performance Curriculum.

- Allow the commercial sector of the driver education community to identify existing materials or develop new materials that were capable of fulfilling Safe Performance Curriculum requirements.
- Allow various groups within the research team to work independently and at physically separated locations in preparing materials for the pilot test of the curriculum.

It is the specifications that truly define the Safe Performance Curriculum; the materials prepared from these specifications constitute a "course" rather than a curriculum. The materials prepared for the implementation of the Safe Performance Curriculum within the Kansas City School System represent only one possible form that curriculum implementation may take. The instructor and student materials developed under this contract, and guidelines for their use are included in *Driver Education Curriculums for Secondary Schools: User Guidelines*, final report.[1]

MATERIAL RESOURCES

It was originally assumed that instructional materials required for the pilot implementation of the curriculum could be obtained largely on a loan or contributory basis from various sources across the country. However, in many cases (e.g., written materials for students and instructors), new materials had to be developed, since existing materials did not meet the specifications. Existing materials pursued objectives that were irrelevant to the Safe Performance Curriculum, or approached the subject matter in ways that did not coincide with the instructional sequence outlined in the specifications.)

The sources of materials utilized in the pilot test are described below:

Instructor Materials

Instructor guidance packages were developed by project staff in accordance with the specifications. They include objectives, course schedules, and detailed guidance for the conduct of each classroom, simulator, range, and on-street lesson. The instructor materials were reviewed by experts in the field of driver education and were revised after each pilot test of the curriculum. Revisions were primarily in the areas of feasibility and improvement of media. (For example, lessons that were too long were shortened; newly-developed films and slides were employed in Fall and Spring implementations.)

Student Materials

Student materials were prepared by Ginn and Company, textbook publishers, in accordance with curriculum specifications. The company furnished materials in sufficient quantity for the Summer and Fall pilot test implementations. Student materials were also revised after each pilot test, primarily for the purpose of motivating students to use the materials. (For example, the amount of content was reduced, language level was simplified, and the number of picture and diagrams was increased.)

Graphic Materials

The development of graphic materials through project resources was economically prohibitive. Motion picture films, filmstrips, slides, and audio tapes were supplied by the

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[1] Human Resources Research Organization. *Driver Education Curriculums for Secondary Schools: User Guidelines*, final report prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, by Human Resources Research Organization (HumRRO), Alexandria, Virginia, under Contract No. HS-003-2-427, September 1974.

manufacturers listed in the Acknowledgments section of this report. Although various segments of the available media met the objectives of the curriculum, much of the footage and visual displays did not approach the subject matter as outlined in the specifications. Those segments were deleted from presentations. Sound tracks accompanying simulator films were not used in most cases, since the narration dealt with subject matter that was not appropriate for lesson objectives. In only a few instances did an entire film or presentation meet the objectives of a particular lesson. Segments from a number of different films often were used for a single presentation, with the instructor supplying the narration. This placed an added burden on the instructor and resulted in a less-than-optimum training aid.

It was originally intended that graphic aids, which would provide an alternative to the written presentation of the student materials, would be available for use by the student on an independent basis. However, many of the available resources (e.g., filmstrips and audio tapes) either employed a vocabulary that was too difficult or pursued objectives that were irrelevant to the Safe Performance Curriculum.

Equipment and Facilities[1]

The primary items of training hardware called for in the curriculum were simulators and multimedia systems. Simulation equipment for the pilot test was supplied by Visual Educom and Singer/Link. One 16-place, trailer-mounted unit was installed at each of the three participating schools. A complete multimedia system, including an audio-visual presentation system, student responder, and instructor console, was installed at each of the schools by Visual Educom.

Additional Training Equipment, Devices, and Facilities

Other items of training equipment, devices, and facilities, provided at each of the three instructional sites, are listed below.

Training Equipment

- Classroom equipment
    - Chalkboards
    - Slide projector
    - Filmstrip projector
    - Overhead projector
    - Multimedia station
    - Projector screen (7')
    - Record player
    - Film splicer and tape
    - Bulletin board
    - Group tables
    - Folding chairs
    - Partitions
    - Cassette recorders/players

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[1] In some cases, particularly with regard to classroom and office equipment, the pilot test school was able to supply some of the needed items. In other instances (i.e., with projectors, multimedia equipment, simulators, and vehicles) the items were loaned to the project by the manufacturers listed in the Acknowledgments section of this report.

- Office equipment[1]
  - Teacher desk and chair
  - Bookcases (2)
  - Student desks and chairs (30)
- Range equipment
  - Traffic cones (100, 27½")
  - "Stop" and "Yield" signs
  - Flags and poles
  - Voice projector
  - Car numbers
  - Stop watches
  - Measuring tape
  - Rain gear
  - Tire gauges
  - Jumper cables

Devices

- Automobile simulator (trailer-mounted, located in parking areas immediately adjacent to schools), with:
  - Student stations (16)
  - Motion picture projector
  - Master control console
  - Print-out unit
  - Screen (10')
  - Chalkboard
  - Air conditioner and heater
  - Trailers (sizes 10' x 60'; 12' x 60'; and 12' x 64')
  - Bulletin board
  - Operator manuals
  - Flashlight pointer
  - Headphones
- Magnetic traffic board with model vehicles

Vehicles[2],[3]

- Range vehicles (8)[4]
- Street vehicles (4), with:
  - Car top sign
  - Instructor mirrors

[1] Office space for the project director, curriculum administrator, and secretary was provided by the Kansas City Board of Education.

[2] Car dealers in the Kansas City area, through the auspices of the Missouri Automobile Dealers Association, provided the vehicles needed for the project. The dealers also maintained and serviced the vehicles. Because of security problems associated with keeping the vehicles at the pilot test schools, each instructor drove a vehicle to and from work; the remaining vehicles were stored in fenced, locked-in areas near the schools.

[3] Vehicle requirements are based on the following student/teacher ratios (per 55 minute period): 16 to 1 for range instruction (two students per car); and 3 to 1 for on-street instruction (four instructors available at each site).

[4] It was originally intended that a "special effects" vehicle, equipped for simulation of automobile emergencies (e.g., blowouts, brake failure, stalls) would be designed. However, due to a variety of problems associated with conducting range training in the emergency skills (e.g., locating adequate facilities, shuttling students, time restraints), training in "car" emergencies did not take place in the pilot test. (Emergency skills training centered on serpentine, blocked-lane, and double blocked-lane exercises.)

  - Eye direct mirrors
  - Dual brakes
  - Accelerator and brake extensions
  - Pillows
  - First aid kits
- Station wagons (4),[1] shared by all three schools for shuttling purposes
- Bus (rented) for Evasive Range instruction and testing

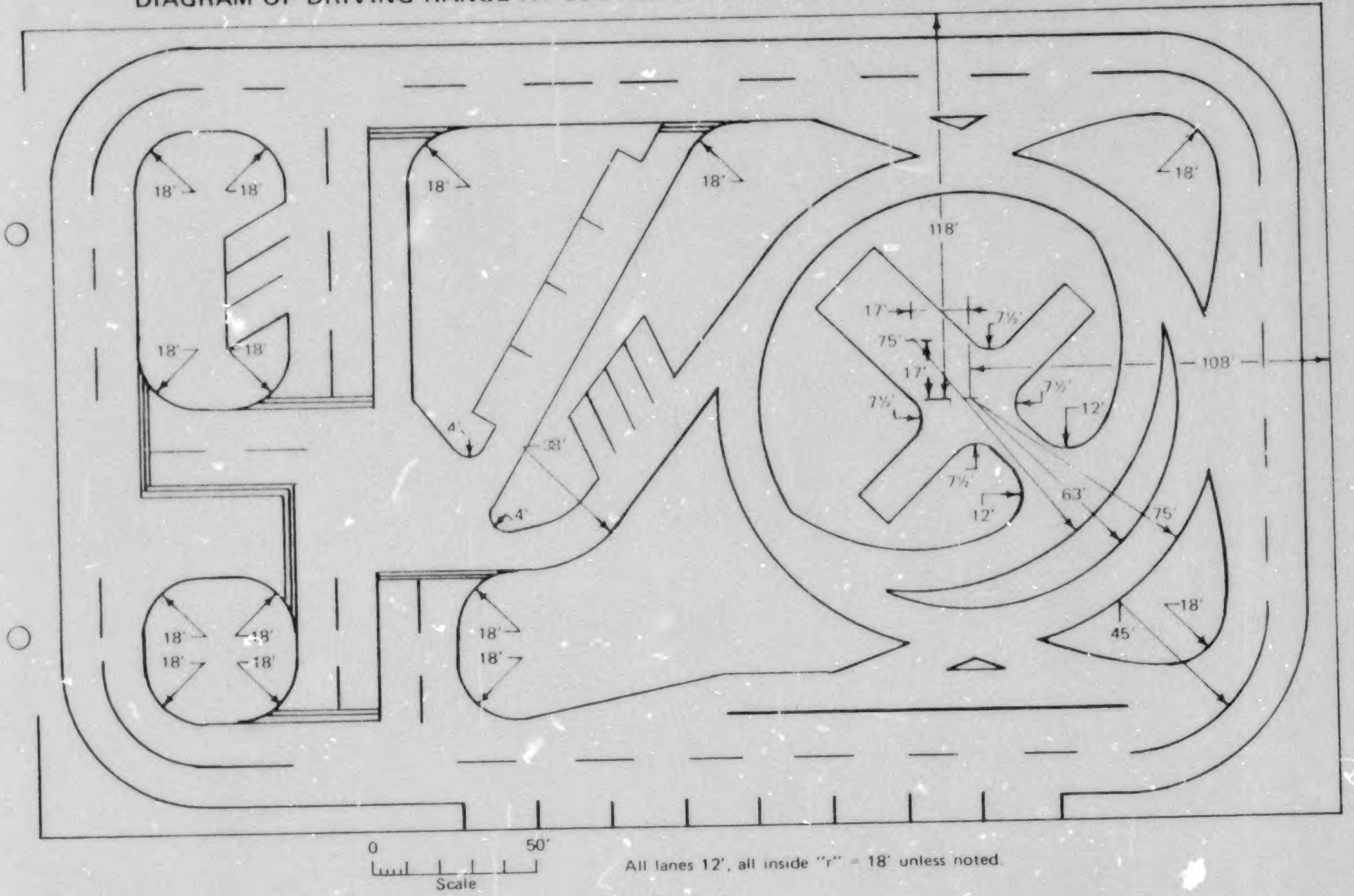
Facilities

- Classrooms
  Sizes: 30' x 40'; 30' x 54'; and 30' x 39'
  Student/teacher ratio: 30 to 1
- Range areas
  Parking lots at or near the pilot test schools were used for range facilities. Markings were painted on each range area under the supervision of a driver education teacher-administrator and in accordance with a prepared design for each range area. (Diagrams of the range areas used for the Spring, 1974 semester are shown in Figures 2 and 3. Two schools used the range at East High School.)
- Evasive Range area[2]

[1] A mini-bus for a $300 monthly rental fee was used to shuttle students during the Fall, 1973 school term.

[2] A range area of at least 300' x 600'--800' is needed for the evasive range lessons and test conducted during Unit 7. Since the test site range areas did not meet these specifications, instruction and testing took place on Saturdays, and students were bused to an appropriate site.

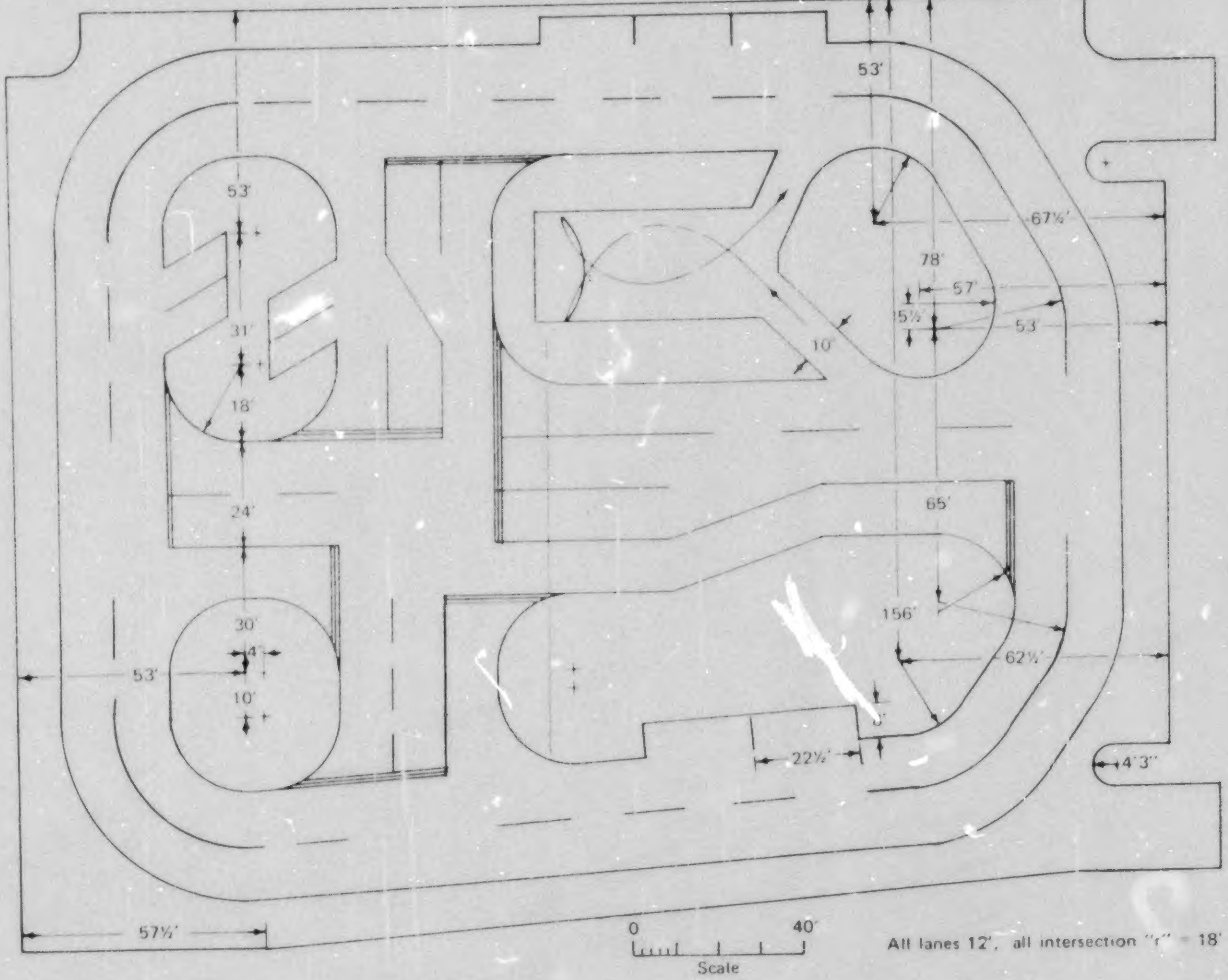
DIAGRAM OF DRIVING RANGE AT SOUTHEAST HIGH SCHOOL, KANSAS CITY, MISSOURI



All lanes 12', all inside "r" = 18' unless noted.

Figure 2

DIAGRAM OF DRIVING RANGE AT EAST HIGH SCHOOL, KANSAS CITY, MISSOURI



All lanes 12', all intersection "r" = 18'

Figure 3

Chapter 2

DESIGN AND ORGANIZATION OF THE SAFE PERFORMANCE CURRICULUM

It was intended that the Safe Performance Curriculum would be administered in six basic instructional modes:

(1) Independent Study
(2) Classroom
(3) Guided Learning
(4) Range
(5) On-Street
(6) Adult Supervision[1]

INDEPENDENT STUDY

It was originally assumed that most driver education instruction, concerned with a straightforward presentation of information, could be handled through independent study material. With the Safe Performance Curriculum, the use of independent study materials was considered not only advantageous but a necessity. The amount of information that must be acquired by the student to meet the instructional objectives is more than the amount that can be accommodated through classroom instruction.[2] (In an attempt to ensure that students understood the information presented in the independent study material, time was set aside in the schedule for more "traditional" approaches (e.g., lecture) to be used in the classroom.)

In actuality, however, it was clear that students were not reading the materials. Revised materials were shortened and simplified in an effort to motivate students to use them. Some audio-visual aids (e.g., filmstrips and sound tapes), which students could use on an individual basis, were identified. However, most of the available media employed a vocabulary that was too difficult or pursued objectives that were irrelevant to the Safe Performance Curriculum. The primary problem appeared to be that students simply did not devote time outside of school to the study of the materials.

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[1] The application of the adult supervision mode in the Kansas City pilot program was weakened by Missouri law, which permits students between the ages of 15 and 16 to operate a motor vehicle on public streets only under the supervision of a certified driver education instructor. Since the majority of the students involved in the Kansas City program were under the age of 16, adult supervision materials concentrated upon practice which could be provided on off-street facilities. However, establishing and maintaining contact with parents was not feasible, due to other administrative considerations which took priority over the implementation of this mode. A current NHTSA study involves the development, pilot testing, and evaluation of a parent participation program in driver education in-car instruction. Materials developed under this contract will be used in the adult supervision mode of the Safe Performance Curriculum. The work is being performed by the Human Resources Research Organization (HumRRO), Alexandria, Virginia, under Contract DOT-HS-4-00993.

[2] As mentioned earlier, the design of the Safe Performance Curriculum is such that materials were developed to cover *all* of the instructional objectives. With further research and refinement of materials, the requirement for independent study may be substantially reduced.

It also became apparent that the independent study materials were not truly suitable to the instruction of inner-city youths, who comprised approximately 50% of the pilot test sample. For effective instruction, the inner-city students required materials using language, examples, situations, and exercises that were unique for that group. Preparation of such specialized materials was beyond the scope of this project.

By the third pilot test implementation (Spring, 1974), more than 50% of the students in the Safe Performance Curriculum indicated in a survey that they read the independent study materials "some of the time," while 43% indicated they read the materials "most of the time." Only 5% said they did not read the materials at all. However, the average scores on knowledge tests administered in the Spring, ranged from 69% to 60%, indicating an over-emphasis on independent study materials, since most of the items on the tests were covered in the student materials.

The independent study materials themselves are fashioned into a number of "Learning Activities Packages" or LAPs. A LAP typically contains content information, illustrations, exercises, self-tests, and a list of alternative learning resources. A separate LAP is provided for each module. (This breakdown of the curriculum is presented later in this chapter.)

CLASSROOM

Independent study materials were intended to communicate the majority of information, and classroom instruction was intended to be used solely for *application* of this information. The most cost-effective use of classroom instruction in the Safe Performance Curriculum is in providing interaction among students and between students and instructor. In the classroom, the learning activities of students are "directed" by the instructor. Through questions, classroom exercises, and various types of visual presentations, the instructor helps students recall and apply information (ideally) they have acquired through independent study. For example, students may "talk through" the task of making the right turn at an intersection, applying principles of observing, communicating, adjusting speed, and positioning. Other variations of classroom instruction include group discussion of alcohol and drugs, role playing post-accident activities, map exercises in route planning, and simulated vehicle servicing activities.

Simulation

In the Safe Performance Curriculum, simulation is treated as an audio-visual aid to classroom instruction rather than as an independent instructional mode. The purpose of maintaining this classroom orientation is to encourage instructors to:

(1) Alternate between simulation and other forms of instruction during class, rather than conduct simulation entirely in one hour blocks.

(2) Integrate simulation with other instructional content in a coordinated program, rather than accepting simulator films as independent packages.

(3) Become more involved in programming and maintaining student simulator learning experience.

The alternation of simulator and other forms of classroom instruction was constrained by a lack of classroom space and the consequent need to use trailer-mounted equipment. However, the remaining aspects of this approach were maintained. Simulator programs were reconfigured to support other classroom and behind-the-wheel instruction and to permit the instructor to adjust the simulator instruction to individual student needs.

Simulation was not intended to assist in the development of manipulative skills. The development of these skills would require a realistic vehicle response to the driver's control actions. In the simulation devices available to driver education, the motion of the vehicle, as reflected in the visual display, is "frozen" on film and cannot respond to the driver's controls.

In the Safe Performance Curriculum, an attempt was made to confine the use of simulation to what it does best:

- Permit low-cost familiarization with vehicle displays and controls.
- Permit application of normal driving principles by exposing students to a selected set of simulated tasks.
- Develop perceptual skills through visual simulation of complex traffic patterns.
- Aid in the selection of emergency evasive responses through visual simulation of driving emergencies.

GUIDED LEARNING

The concept of guided learning arose during course scheduling. The scheduling requirements for the pilot test were unique in that four instructors were usually available during each period. (See Chapter 6 for more details on staffing requirements.) Although 30 students could be accommodated within one period, (e.g., in classroom), there were times throughout the schedule when only 15 of those students would be receiving instruction (e.g., the simulator lab and range accommodated a maximum of 16 students). In most cases, only one instructor was required on the range or in the simulator lab; thus, three instructors and 15 students were not occupied. To make maximum use of this "free" time, guided learning sessions were created. These sessions allow students to interact with the instructor to determine the areas that students need to work on, and to actually work on these areas. These sessions provide time, not only for slow learners to cope with deficiency problems, but for advanced students to work ahead. While guided learning sessions may cover particular topics with the aid of specific instructional materials and devices, this instructional mode is primarily responsive to individual student needs, rather than to a prepared plan.

Guided learning sessions are not study halls or lectures. What makes them different is the input provided by the instructor. The instructor helps the student become aware of those learning resources that would be most helpful to him at the time. The instructor's role in these sessions is *not* that of a tutor, where he instructs individual students in the course content. Rather, the student engages in his *own* instruction, which can involve reading, viewing filmstrips, or possibly working with a small group of other students on an exercise. If space is available in the simulator lab or on the range, students may participate in those activities. In addition, if two instructors are available during a guided learning session, students with performance-related problems might be taken on-street for additional behind-the-wheel practice.

Ideally, the physical location for guided learning should be designed to accommodate individualized instruction (e.g., study carrousels for individual work, a sufficient number of tape players, filmstrip projectors, headphones). In the pilot test, facilities and audio-visual equipment for individualized instruction were limited, as were instructional materials, to support this mode. Guided learning took place in the classroom, and existing materials that met the specifications were utilized. However, there is still a need for instructional materials to be developed to support guided learning.

Progress Charts

Guided learning presumes that the teacher can follow the exact progress of each student, to ensure that each student in the Safe Performance Curriculum meets all of the course objectives. In response to this need, progress charts were devised to keep a record of student performance.[1] There is a progress chart for both on-street and range lessons. (Figure 4 illustrates portions of both sides of the Range Progress Chart.) The two charts are similarly designed, differing only in the list of tasks for each lesson.

Each student is also required to keep his own progress chart. The purpose of the student progress chart is to encourage the student to participate more actively in his own learning process by thinking about his own needs, and to give a visual record of accomplishments, with the hope that success will encourage further achievement.

RANGE

Range (or off-street) instruction in the Safe Performance Curriculum provides initial development of vehicle operating skills. Any off-street area of sufficient size can be used for this instructional mode, provided traffic conditions can be structured. This instructional mode has two major benefits not offered by on-street instruction:

(1) Economy. One or two instructors can supervise eight off-street vehicles, allowing a lower teacher/student ratio than the one-to-one relationship needed for on-street instruction.

(2) Control of traffic patterns. Instructors can control the roadway configurations and traffic patterns during range instruction to a far greater extent than they can during on-street instruction.

The specific skills toward which range instruction is directed include the following:

- Basic vehicle control. Initial development of skills and lateral and longitudinal control of the vehicle can be provided without complicated roadway configurations or the interference of traffic.
- Normal Driving. Initial skill in interacting with various roadway configurations or traffic conditions can be provided under conditions of gradually increasing complexity.
- Emergency Skills. A variety of emergency conditions can be simulated (e.g., blocked lane), allowing safe development of emergency skills.

Since the focus of range instruction is on student-vehicle interaction, a minimum of time is devoted to simple communication of information, a function most cost-effectively handled through independent study material or classroom instruction.

Parking lots at or near the pilot test schools were used as range areas in the curriculum implementation. Most had inadequacies (e.g., size was either too large or too small; surface was degraded). As indicated in Chapter 4, the lack of adequate range facilities was noted as a contributing factor in range accidents.

ON-STREET

On-street instruction permits development, evaluation, and diagnosis of all the skills required in actual driving. Only during on-street instruction is the full range of driving tasks encountered, although some tasks, because they occur so infrequently, are not

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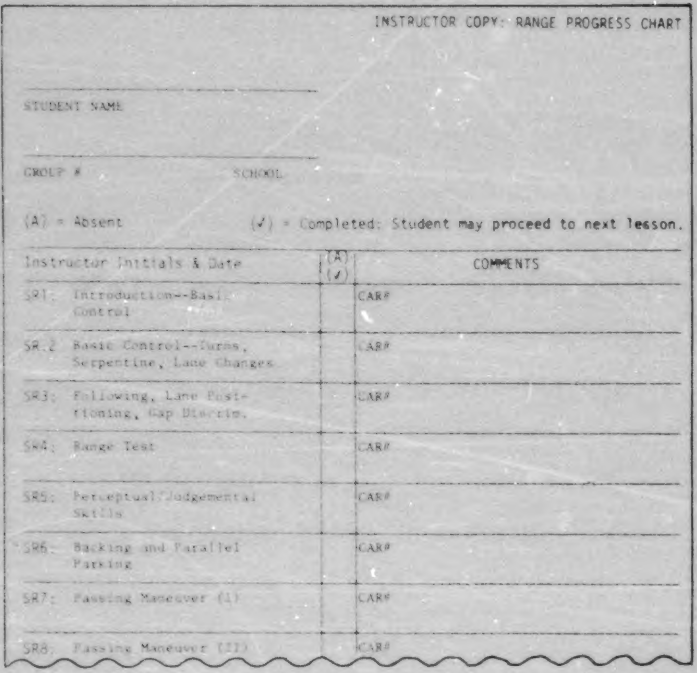
[1] See Unit 1 of *User Guidelines* (10) for a detailed explanation of guided learning and the use of progress charts.

SAMPLE RANGE PROGRESS CHART

Front side of Range Progress Chart, which provides space for instructor to "comment" on student performance for each lesson.



INSTRUCTOR COPY: RANGE PROGRESS CHART

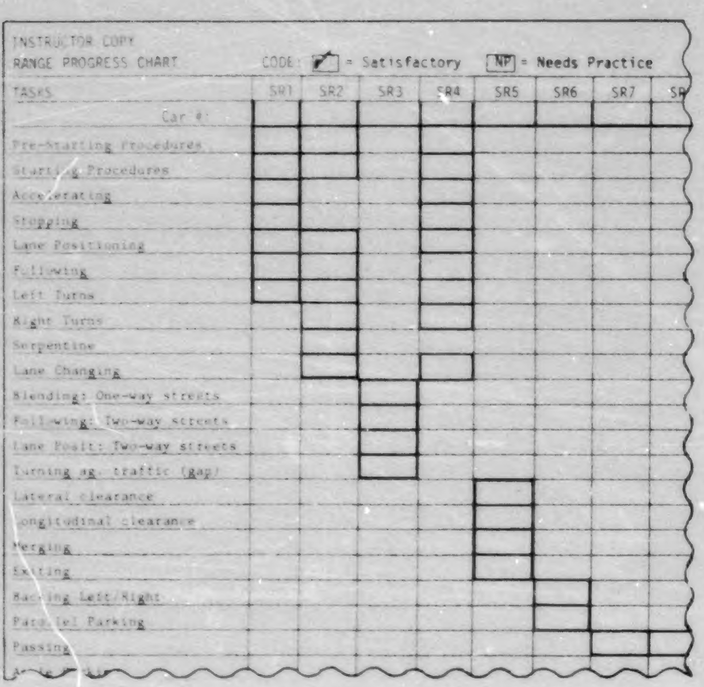
STUDENT NAME

GROUP #　　　　SCHOOL

(A) = Absent　　　(✓) = Completed: Student may proceed to next lesson.

Instructor Initials & Date	(A) (✓)	COMMENTS
SR1: Introduction--Basic Control		CAR#
SR.2 Basic Control--Turns, Serpentine, Lane Changes		CAR#
SR3: Following, Lane Positioning, Gap Discrim.		CAR#
SR4: Range Test		CAR#
SR5: Perceptual/Judgemental Skills		CAR#
SR6: Backing and Parallel Parking		CAR#
SR7: Passing Maneuver (I)		CAR#
SR8: Passing Maneuver (II)		CAR#

Reverse side of Range Progress Chart, which details performances for each lesson and provides space for the instructor to note whether the student can perform the given task or whether he needs more practice. Darkened areas indicate task "concentrations" for each lesson.



INSTRUCTOR COPY
RANGE PROGRESS CHART　　CODE: ✓ = Satisfactory　NP = Needs Practice

TASKS	SR1	SR2	SR3	SR4	SR5	SR6	SR7	SR
Car #:								
Pre-Starting Procedures								
Starting Procedures								
Accelerating								
Stopping								
Lane Positioning								
Following								
Left Turns								
Right Turns								
Serpentine								
Lane Changing								
Blending: One-way streets								
Following: Two-way streets								
Lane Posit: Two-way streets								
Turning ag. traffic (gap)								
Lateral clearance								
Longitudinal clearance								
Merging								
Exiting								
Backing Left/Right								
Parallel Parking								
Passing								

Figure 4

handled on street. Those that are sufficiently critical to warrant concern (e.g., emergencies) must be simulated in some off-street environment, such as a range or driving simulator.

In the Safe Performance Curriculum, on-street instruction focuses almost entirely on the more complex skills required in coping with normal roadway and traffic conditions. (Adverse weather conditions are dealt with whenever they arise during the on-street sessions.) Relatively less attention is given to instruction and evaluation concerned with basic vehicle control, since these skills are more cost-effectively dealt with through off-street instruction. As indicated earlier, simple communication of information, except for the provision of feedback on student performance, is confined to classroom and independent study preparation.

ADULT SUPERVISION

A driver education course that seeks to develop high levels of skill must first assure the attainment of fundamental, lower-level skills. Instruction in complex perceptual skills and evasive maneuvers will not be effective unless students have first mastered basic control skills and developed the ability to apply these skills to normal driving. Attempting to attain a mastery of fundamental skills purely through formal secondary school instruction does not seem cost-effective if, indeed, it is even possible.

One alternative route to mastery of low-level skills is through out-of-school practice under the supervision of a responsible adult, for example, parent. The role of the adult is confined to supervision (rather than instruction) and includes (a) selecting the driving environments that will provide the necessary practice, (b) being responsible for the safety of the vehicle, and (c) reporting on general progress as well as specific strengths and weaknesses of the student. Efforts in this regard are guided by written or printed materials furnished by the instructor.

It may be anticipated that students will receive supervised practice under the guidance of parents or friends, whether or not such practice is fostered by the instructor. By providing the guidance materials, the instructor may ensure that adult efforts support, rather than detract from, formal school instruction.

CURRICULUM ORGANIZATION

The Safe Performance Curriculum is divided into eight instructional units, each representing a set of objectives[1] that are relatively homogeneous with respect to their underlying instructional requirements. Each unit, with the exception of Units 1 and 6, is then divided into modules of a scope and size appropriate to an individual instructional experience. A brief description of the instructional objectives for each unit follows:[2]

> Unit 1, Introduction: To acquaint the student with the goals, content, methods, and requirements of the Safe Performance Curriculum.
>
> Unit 2, Basic Control Tasks: To enable the student to control the longitudinal and lateral motion of the car and to execute simple maneuvers.

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[1] As noted in the Introduction, the instructional objectives were derived from the *Driver Education Task Analysis, Volume I: Task Descriptions* (6), which served as the basis for the development of this curriculum.

[2] A detailed explanation of each lesson in the Safe Performance Curriculum appears in the *User Guidelines*, final report (10).

Unit 3, Normal Driving: To enable the student to apply the procedures required for safe driving under normal highway and traffic conditions.

Unit 4, Environmental Factors: To enable the student to apply safe driving procedures under degraded environmental conditions.

Unit 5, Complex Perceptual Skills: To enable the student to deal effectively with situations involving complex stimulus patterns.

Unit 6, Driver Influences: To enable the student to control, recognize, and compensate for the effect of factors that degrade his ability to operate an automobile.

Unit 7, Emergency Skills: To enable the student to select and carry out responses required to handle sudden emergencies.

Unit 8, Nonoperational Tasks: To enable students to prepare themselves and their vehicles for responsible operation within the highway transportation system.

Units 1, 2, and 3 constitute what might be called "basic" driver education. Units 4, 5, and 7 constitute what might be called "advanced" instruction. Units 6 and 8 deal with the "nondriving" aspects of vehicle operation.

An outline of the module breakdown within each unit is shown in Figure 5. Note that Units 1 and 6 are not broken down into modules, since the instructional objectives for those units were such that content could be presented within a single module. Table 1 shows, by curriculum unit, how much *time* is devoted to each instructional mode in both the Safe Performance Curriculum and the Pre-Driver Licensing course.

PRE-DRIVER LICENSING COURSE: CONTENT SUMMARY

As mentioned in the Introduction, students in a Pre-Driver Licensing (PDL) course served as a comparison group in the pilot test. The PDL course consists of the minimum essentials required for the granting of a motor vehicle operator's license. An overview of the course is presented here.

Instructor Guidance Packages for the Pre-Driver Licensing (PDL) course accompany the *User Guidelines* (10). These packages provide detailed instructions for the conduct of each lesson in the PDL course. In general, within the purpose of preparation for a license, the PDL course employs the same methods and materials[1,2] that support the Safe Performance Curriculum. The major differences between the two courses are the time allocated for instruction and the amount of safety content covered.

In Unit 1, classroom instruction in both courses centers on orientation to the course. In Unit 2, the first range lesson, "Introduction—Basic Control," is the same for both courses. In the second range lesson, PDL students receive instruction in turns and two-way traffic; SPC students in turns, serpentine, and lane changes. The third range lesson for the PDL course covers backing and parallel parking; in the SPC, following, lane positioning, and gap discrimination. (SPC students do not receive instruction in backing and parallel parking until the sixth range lesson.) A range test in basic control tasks is administered to students in both courses in the fourth range session.

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[1] See *User Guidelines*, final report (10).

[2] PDL students receive two of the twenty-one Learning Activities Packages (LAPs) which support the Safe Performance Curriculum. These are LAPs 2-1 and 2-2. Also, PDL students receive instruction in only three units as compared to eight for Safe Performance Curriculum students.

SAFE PERFORMANCE CURRICULUM OUTLINE

- Unit 1 Introduction
  - **In-Processing**
  - **Overview of Content and Schedule**
  - **Introduction to Materials**
  - **Student Responsibilities**
  - **Assessment of Student Capabilities**
- Unit 2 Basic Control Tasks
  - ***2-1 Control of the Car**
    - Preoperative Procedures
    - Longitudinal Control
    - Lateral Control
  - **2-2 Simple Maneuvers**
    - Backing
    - Turnabouts
    - Parking
- Unit 3 Normal Driving
  - **3-1 Observing**
    - Scanning
    - Situational Observations
  - **3-2 Communicating**
    - Changes in Direction
    - Changes in Speed
    - Presence
  - **3-3 Adjusting Speed**
    - Adjusting to Traffic Flow
    - Adjusting to Roadway
    - Adjusting to Conditions
  - **3-4 Positioning**
    - Space Cushion
    - Compromise and Separating Risks
    - Right-of-Way Courtesy
- Unit 4 Environmental Factors
  - **4-1 Limited Traction**
    - Responding to Limited Traction Conditions
  - **4-2 Limited Visibility**
    - Improving Visibility
    - Compensating for Limited Visibility
  - **4-3 Night Driving**
    - Improving Ability to See During Darkness
    - Compensating for Inability to See
    - Headlight Failure
  - **4-4 Car/Driver Stressors**
    - Car Stressors
    - Driver Stressors
- Unit 5 Complex Perceptual Skills
  - **5-1 Distance/Time Perception**
    - Following/Overtaking
    - Gap While Stationary
    - Gap While Moving
    - Passing Distance
    - Stopping Distance
  - **5-2 Hazard Perception**
    - Evaluating Criticality
    - Responding to Hazards
- Unit 6 Driver Influences
  - **Physical Condition**
  - **Emotional Condition**
  - **Alcohol and Drugs**
- Unit 7 Emergency Skills
  - **7-1 Evasive Maneuvers**
    - Selecting Maneuvers
    - Controlling the Car
  - **7-2 Skid Control**
  - **7-3 Car Emergencies**
- Unit 8 Nonoperational Tasks
  - **8-1 Breakdowns and Accidents**
  - **8-2 Maintenance and Servicing**
  - **8-3 Trip Planning**
  - **8-4 System Improvement**

Figure 5

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*Hyphenated numbers represent modules within the unit.

Table 1

Time Spent in Instructional Modes, by Curriculum Units

Curriculum Unit	Instructional Mode[a]			
	Classroom	Simulator	Range	On-Street
Safe Performance Curriculum (SPC)[b]				
1. Introduction	3	--	--	--
2. Basic Control Tasks	2	2	4[c]	--
3. Normal Driving	5	2	4	2
4. Environmental Factors	3	1	1	--
5. Complex Percep. Skills	7	1	1	3
6. Driver Influences	4	--	--	--
7. Emergency Skills	2	1	4[c]	1
8. Nonoperational Tasks	5	--	--	1[d]
Total	31	6	14	7
Pre-Driver Licensing Course (PDL)[e]				
1. Introduction	1	--	--	--
2. Basic Control Tasks	1	2	4[c]	--
3. Normal Driving	6	--	--	2
Total	8	2	4	2

[a] Numbers show 55-minute periods.

[b] The SPC student also spends 18-20 periods in Guided Learning sessions and one period on-street for "open practice."

[c] Includes range test.

[d] Represents final on-street performance test.

[e] PDL students also take the final on-street performance test.

In Unit 3 classroom sessions, instruction in the PDL course centers on information provided in the state dirver's manual (e.g., rules of the road). The primary objective here is to prepare PDL students for the driver license test. In the SPC, the primary concern is to enable students to be "safe" drivers. Although content related to obtaining a license is also presented in the SPC, the emphasis here is on the safe driving procedures required for responding to a wide range of highway and traffic-related tasks (e.g., negotiating intersections, passing, merging, etc.).

The two on-street sessions in Unit 3 are the same for both courses, as are the two simulator sessions in Unit 2. The Knowledge Pre/Post-Tests, On-Road Performance Test, and Unit Knowledge Tests for LAPs 2-1 and 2-2 are administered to students in both courses. In the pilot implementation, PDL students also receive the Attitude Measure and Perceptual Skills Test, although they have not received instruction in these areas. Test results were used primarily for comparison purposes with students in the SPC. (Tests are discussed in more detail in Chapter 4.)

Chapter 3

DESIGN AND DESCRIPTION OF PILOT TEST

The most important purposes of the pilot test were to determine (a) whether students receiving instruction under the Safe Performance Curriculum (SPC) were successful in attaining the objectives from which that curriculum was derived and (b) whether attainment of the instructional objectives leads to safe driving (i.e., accident reduction). A third purpose was to determine whether students assigned to the Safe Performance Curriculum were more successful in attaining the knowledge and performance objectives than students assigned to the Pre-Driver Licensing (PDL) course.

PILOT TEST DESIGN

The specific experimental hypothesis to be tested was as follows:

> There will be significant increases in driving knowledge, skill, safer attitudes and habits as a result of attending the SPC or PDL, and the changes will be greater for the SPC than for the PDL.

The basic research design of the pilot test was to assign qualified driver education applicants to one of two treatment groups (SPC and PDL) and a control group. The SPC and PDL groups were then administered the driver education programs described in Chapter 2 and tested by intermediate criterion measures. The intermediate criteria represent measures of those characteristics that were identified through the Task Analysis (6) as being prerequisites to safe driving performance, but the performances that ultimately serve as measures of attainment of course objectives are real-world driving performances (i.e., accidents and violations), not test measures. However, as an initial evaluation approach, the administration of intermediate criteria is important from the perspective of indicating whether there is *any* potential for improving real-world performances. If, for example, no improvement in knowledge acquisition or skill attainment was detected, as evidenced by test scores, then the potential for improvement in the real-world situation would be expected to be low. The intermediate criteria (if valid predictors of real-world performance) provide a basis for determining whether students have attained those knowledges and skills identified through the Task Analysis (6) as being highly critical to safe driving. In addition, the intermediate criterion measures allow the components of the program that may require modification to be scientifically identified.

Although initially planned, the present study does not evaluate the effects of the experimental instruction on subsequent accidents or violations nor relate real-world driving behavior to the instructional system. The sample size in the pilot implementation, as will be explained in "Pilot Test Description" later in this chapter, was too small to allow for such evaluation.

The primary criteria for a definitive evaluation appear to be:

(1) Administration of the program in a state(s) where adequate control can be exercised over the training and the content of the SPC program as well as the comparison program, whether it is a control group or another comparison program, such as the PDL.

(2) Tightly controlled monitoring requirements to obtain the necessary follow-up information for evaluation, such as address files and identification of students obtaining licenses.

(3) Adequate[1] sample sizes, so that practical program differences can be detected with a high degree of confidence, and an adequate follow-up period can be attained to approach a stable and reliable measure of driving performance.

INTERMEDIATE CRITERION MEASURES

The most immediate feedback on course effectiveness is obtained through the use of intermediate criterion measures. The relative effectiveness of the Safe Performance Curriculum and the Pre-Driver Licensing course was measured by comparing the test results. The comparisons provided input on the relative effectiveness of each form of instruction.

The intermediate criterion measures were administered to students in both the Safe Performance Curriculum and the Pre-Driver Licensing course, with the exception of the Evasive Range Test and Knowledge Tests for Units 3, 4, 6, 7 and 8. These were administered only to students in the Safe Performance Curriculum. In the pilot test, the intermediate measures included the following:

1. Driving Knowledge Pre/Post-Tests—a 50-item test covering all units of instruction.
2. Unit Knowledge Tests—tests designed to assess the student's mastery of informational content in the Learning Activities Packages (LAPs).
3. Basic Skills Range Test—a performance test of the student's ability to control the longitudinal and lateral motion of the car and to execute simple maneuvers.
4. Perceptual Skills Test—a test in which the student responds to moving situation (16mm film) requiring distance-time judgments and the identification of hazards.
5. Evasive Range Test—a performance test of the student's ability to perform extreme steering and braking procedures required in carrying out evasive maneuvers in response to simulated emergency situations.
6. On-Road Performance Test—a performance measure calling for observation and recording of student responses to a variety of commonly encountered highway and traffic situations.
7. Attitude Measure—a pseudo-factual "knowledge" test, designed to reveal beliefs concerning issues of importance to driving safety.

In Chapter 4, each of these measures is discussed in detail.

PILOT TEST SAMPLE

As mentioned earlier, the pilot test was conducted in the Kansas City, Missouri School System. A minimum of three schools was needed to meet sample size requirements for measuring content acquisition. While more than three schools were

[1] Approximate samples required to detect at least a 10% difference in accident rate (with a one-year followup) are estimated to range from 1,500 to 2,000 subjects per experimental group. More precise estimates would be based on decisions in regard to program effects that can be cost-effectively obtained, associated confidence levels, accident rate for the study population, and the length of the follow-up period (related to accident rate).

available, economy of resources—instructors, simulators, facilities, etc.—dictated that no more than three schools be used. However, students from other schools attended the instructional sites on an after-school basis.

For the Spring 1974 term, the sites were East, Southeast and Northeast High Schools. The racial distribution of these schools is as follows: East High School is 77% white, from low- to high-income; Southeast High School is 98% black, low- to middle-income; and Northeast High School is 97% white, from middle- to upper-income. In the Summer and Fall pilot programs, East, Lincoln, and Southwest High Schools served as pilot test sites. Lincoln was primarily black, low- to middle-income and Southwest was primarily a white, middle- to high-income school.

Eligibility Requirements

The characteristics of the student sample may be defined by the following eligibility requirements:

Age. In Missouri, 15 years is the minimum age at which a resident may operate a motor vehicle under the supervision of a certified instructor. A minimum age of 16 had been considered for the research program in order to assure that all students could receive parent-supervised instruction. However, a survey showed that too few 16-year olds would be interested, or eligible on other grounds, to fulfill minimum sample requirements.

Previous Driving Experience. The sample was confined to students who did not and never had possessed a driver's license. This requirement was intended to minimize the number of students with previous driving experience, for whom the instructional program would actually be a "driver improvement" program. Students were asked to note whether they had a driver's license upon entering the program. Those who had a driver's license were eliminated from the sample.

Driving Intention. Cover letters to applicants asked them to apply for the course only if they intended to obtain a driver's license following completion of the course. While this request would not have guaranteed that all students would drive—no such guarantee is possible—it might have helped eliminate some who did not intend to drive.

Solicitation of Students

Invitations for participation in the instructional program and application forms were distributed to all eligible students in the pilot test schools. The following items were included in the course information provided to motivate students to apply:

(1) A description of the benefits which include, in addition to the instruction itself, the lack of an entrance fee, reduction in insurance premiums, preparation for licensing and credit for the course with a passing grade. (It was hoped that the "list" format for benefits would stop short of a "sales pitch" in order to avoid generating resentment on the part of parents of students who were not ultimately selected for a treatment group, that is, students who were assigned to the "no formal instruction" group.)

(2) A brief description of the program and the administrative staff.

(3) An explanation of the random selection process, emphasizing its essential fairness to students.

This information and application forms were distributed to students by program staff members, an approach that was advantageous in that students were able to ask questions about the course and obtain immediate answers. Arrangements were made to have the counselors in each of the participating schools collect the application forms, or to have students return the forms to a special location at each school.

A deadline for application was set and adhered to in order to avoid a situation whereby a student who applied after the deadline might have been selected while another in the same school who applied before the deadline might have been denied enrollment due to the random selection process.

In those instances where the sample fell short at the time of the deadline, applications were solicited from other schools. (In this program, students from other schools have been trained in an after-school session at one of the pilot test schools. Although this is an option for increasing the sample size, experience in the pilot test indicated that this approach should not be used because of extensive attendance problems.)

From the applicant sample, individuals not meeting eligibility requirements were eliminated. Students selected to participate in the pilot test were then randomly divided into three groups and subsequently classified into subgroups on the basis of sex and scholastic achievement. Table 2 shows sample sizes for only the two treatment groups, since data were not obtained for the "no formal instruction" or control group.

Table 2

Composition of Groups, by Achievement Level[a] and Sex

Sex	SPC Group		PDL Group	
	Upper	Lower	Upper	Lower
Male	49	26	59	39
Female	96	80	105	47
Total	251		250	

[a] "Upper" indicates students ranking in the upper half of their classes scholastically; "lower" indicates ranking in the lower half of the class.

The random assignment of individual students to treatment groups represents an unbiased research design in that it eliminates differences between schools or between classes within a school (the random assignment is made within each school). It also allows the individual student to become the unit of an analysis.

In order for the differences between experimental and control groups to be attributed to the effects of the curricula, the groups should be equivalent with respect to all characteristics except their instruction. The only way to assure this equivalence is to select all students from a single population and assign them at random to groups.

Agreement for controlled assignment of students to curriculum and control groups was obtained from the participating school district. The plan was then discussed with officials in each of the participating schools, and agreement was reached to make records available for selection of students and to permit random assignment to groups.

In Chapter 5, "Results of Intermediate Criterion Measures," the reader will note varying sample sizes across the various analyses. For the most part, the sample variation was due to the increasing number of dropouts experienced throughout the semester. In an attempt to obtain complete data, time was provided for students who had missed scheduled tests to make them up. All data received from students were first manually checked for completeness and were then submitted for data processing. Edits were made to determine valid coding and range of responses.

PROBLEMS ENCOUNTERED DURING PILOT TESTING[1]

The problems encountered in conducting the pilot test and in reaching the objectives of the program are discussed below. The purpose of this discussion is to provide future administrators and researchers with a synopsis of practical problems experienced in implementing the curriculum, in the hope that problems can be anticipated and averted. Although some of the problems experienced may be specific to this project, it is felt that the issues raised are general enough to be applicable to future efforts.

Securing Adequate Sample Size

As explained earlier, the pilot test was administered over three semesters—Summer and Fall, 1973, and Spring, 1974. A major problem throughout all three implementations was that of securing an adequate sample size. It was originally intended that a sample of 3,150 students (or 1,050 per group—SPC, PDL, and Control) would be assigned to the pilot test. This breakout is shown below.

Test Session	SPC	PDL	Control
Summer, 1973	150	150	150
Fall, 1973	300	300	300
Spring, 1974	300	300	300
Summer, 1974[2]	300	300	300
	1,050	1,050	1,050

During March, 1973, letters announcing the driver education program and inviting participation were issued directly to students and mailed to parents. As of the end of that month, approximately 700 replies for Summer and Fall participation had been received. This was a little more than half of the 1,350 needed for the Summer and Fall programs. The following steps were undertaken to secure more volunteers: (a) The Kansas City School System agreed to provide course credit; (b) the minimum age for participation was lowered to 15; (c) a more attractive announcement of the program was mailed to parents; and (d) summer enrollment was extended to students from outside of the district served by the three selected pilot test sites.

By June 4, 1973, the first day of the Summer program, 142 SPC and 175 PDL students were enrolled in the program. By July 31, the last day of the Summer program, 76 SPC and 75 PDL students remained. Primary causes for the high drop-out rate (53% for SPC and 43% for PDL) appeared to be Summer jobs, and vacations and difficulty in obtaining transportation to training centers. It is also possible that some of the students originally assigned never attended because of confusion as to their status in the program (see "Random Assignment" in this chapter).

In an attempt to make up for the small number of students trained in the Summer program, and to compensate for scheduling problems and attrition in the Fall, approximately 1,350 students were solicited for Fall in the hope that a sample size of 350 in each group could be attained. However, even with the over-solicitation, only 251 SPC and 239 PDL students enrolled for the Fall program. The attrition rate for the Fall pilot test was substantially lower than that in the Summer—approximately 20% in both groups.

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[1] Detailed requirements for on-site project staffing are provided in Appendix K. Briefly, there were two teams of four instructors (one served as Team Leader) at each site. For the Spring semester, both teams taught one hour in the morning at Northeast High School, then Team A taught four hours at East High School and Team B taught four hours at Southeast High School. A project director and curriculum administrator served in managerial capacities.

[2] The Summer, 1974 pilot test was not conducted, due to failures in obtaining adequate sample sizes in the previous three semesters.

Over-solicitation was again used for the Spring, 1974 semester, but only 254 SPC and 267 PDL were enrolled. Attrition rate for SPC was 16%; for PDL, 18%.

Another sample problem is encountered in the number of students who actually obtain driver's licenses. (For attainment of long-range, follow-up data, this information is crucial—that is, follow-up data cannot be secured on those students in the sample who do not receive licenses.) In a survey conducted in January, 1974, of 173 students from the Summer pilot program, only 44 (or 25%) had received their licenses. The breakout is as follows: 16 of the 62 SPC students (26%); 17 of the 52 PDL students (33%); and 11 of the 59 Control group students (19%) had received licenses.

Assignment of Students to Test Groups

Inadequate administrative control over the assignment process caused a non-random assignment of students to the three groups in the Summer program. This resulted in some Control group students being notified by letter that they were assigned to a treatment group, and vice-versa. Since master lists of student assignments were available, some of these problems were handled simply by telling the Control student he could not take the course, or by trying to locate the students who should have been in a treatment group. The first approach was not always successful, and some Control students remained in a treatment group. The second approach had some failures, too, since many of the students assigned to a treatment group had found Summer jobs or had made other plans when they received the Control group letter.

Because of the scheduling problems associated with the random assignment difficulties in the Summer pilot test, the first day of the Fall and Spring schedules was set aside solely for the purpose of scheduling students. This "extra" day is needed, even if there are no problems in assignment.

In the Fall semester, similar problems occurred in the assignment as had occurred in the Summer. Computerized readouts (assignment had been manual in the Summer) indicated that some students were assigned to two groups (e.g., both treatment and Control), or students who had received treatment in the Summer were assigned to the Fall program. The problems experienced in the Fall can only be attributed to a failure in project management since the responsibility for this task did not change from the Summer semester.

For the Spring semester, the random assignment process was handled directly by the Principal Investigator for the project, and there appeared to be no problems.

Also, in the Spring semester, the random assignment was made in time to meet deadlines imposed by the schools, and students were scheduled as a part of the computerized and normal scheduling process in each school. Scheduling of students in the Summer and Fall semesters had been done manually by the school counselors, and because they had not received assignments in time, the process was rushed.

Need for Planning

In a project of this nature, delays in such activities as revision of materials, printing of instructional and testing materials, and obtaining equipment should be anticipated, and, in some cases, expected. Delays can be extremely critical when materials must be developed on a time schedule involving weeks or even days. The need for planning becomes paramount when a definite schedule such as administering a curriculum to students, must be met.

In the first implementation of the pilot test (Summer 1973), instructors did not have adequate time to review the curriculum materials prior to training. Although the majority of the curriculum development work was completed about two months prior to the pilot test, the staff responsible for the printing and distribution of the materials to the instructors failed to do so. When training staff members arrived at the pilot site for teacher training the week prior to the Summer pilot test, they found that most of the printing had not been done, and that instructors had not received any of the materials. Approximately two days of instructor training were spent arranging for the printing and then hand-collating the materials. Another half to three-quarters of a day of teacher training was spent hauling equipment. Since arrangements had not been made to meet the delivery schedule of the equipment manufacturer, all of the equipment was placed at one pilot site, and several weeks passed before the equipment was finally installed at each of the pilot sites.

These types of problems contributed to implementation difficulties experienced in the Summer pilot test. Much of the revision resulting from the Summer experience was mainly in the area of scheduling and logistics rather than in specifics to curriculum content.

Another major problem in the Summer implementation was the teachers' lack of familiarity with the program. Efforts were directed throughout the Summer and in a two-week training session following the Summer program at familiarizing the instructors with the curriculum. During the meetings with "curriculum developers" on the one hand, and "instructors" on the other, there seemed to be some divisive issues. One of the issues surfaced during training sessions when instructors were asked to demonstrate how to "teach" certain of the lessons in the course. Training consultants then provided guidance to the instructors on methods and techniques to use in the sessions. After some experience with this approach, the instructors unanimously requested that the practice teaching sessions be discontinued in favor of a plan to discuss each lesson, page by page. Since written guidance to instructors for each teaching session was highly detailed, and because they had taught the curriculum throughout the Summer, it was felt there were other underlying factors accounting for their request. The instructors expressed a concern that they had been told to "follow the curriculum exactly, since this was a research project." They had been told not to deviate from the curriculum and guidance materials in any way. Thus, they felt it necessary to "go over it page by page to make sure we understand it precisely." The point was made by research staff that instructors were not expected to blindly follow the curriculum; nor were they to change it merely because they did not like a certain part of it. Training consultants to the project noted, even in the Spring, 1974 semester, that some of the instructors still had misconceptions about the degree to which they could deviate from the guidance materials. That is, they were reluctant to bring their own intuitive capability to the classroom. A combination of factors may have contributed to this problem. Consultants attributed a lack of prior teaching experience on the part of the instructors as one factor. (Other problems associated with instructor inexperience are dealt with in Chapter 6.) Another factor may have been a failure to clearly convey the underlying objectives of the research program to instructors.

By the Fall, 1973 semester, scheduling and logistics problems were under control sufficiently to permit an adequate evaluation of the curriculum materials, particularly in regard to feasibility (i.e., lesson length, sequence, etc.).

In addition to the problems in assigning students to the three groups (discussed earlier), there appeared to be problems in making effective use of instructor time. The teaching load itself appeared to be excessive because of the number of student contact hours (all instructors taught at more than one site each day). In addition, project requirements for data collection and nonteaching tasks (e.g., driving buses, gassing cars, setting up range equipment, storing cars) were taking up an enormous amount of instructor time. To alleviate this problem, two instructor aides were recruited, and classes with small numbers of students were combined.

A simulator fire, caused by a malfunction in the heating system, was still another problem experienced in the Fall semester, which caused a number of inconveniences. Films burned in the fire had to be replaced, and arrangements had to be made to bus students to another site for simulator lab sessions. And finally, a heavy snow storm in the Kansas City area at the end of the Fall semester resulted in the closing of schools. To the project, this meant that many students did not receive the final On-Road Performance Test or Evasive Range lesson instruction.

It was not until the Spring, 1974 semester that the instructional materials and training level of instructors were felt to be adequate for a fair evaluation of the curriculum. The major problem experienced in the Spring semester was a six-week teacher strike in the Kansas City School System. However, most of the time lost was made up by extending the Spring semester into July.

In retrospect, satisfactory implementation might have occurred sooner if a smaller number of students had been trained during the Summer program. The complications of scheduling would have been reduced, and more effort could have been directed toward instructor training and revision of materials.

Vehicle Accident Rate

An unusually high rate of accidents—10 in all—occurred in the Summer semester. Of the 10, there were seven range accidents, five involving PDL students and two involving SPC students. There were three on-street accidents, two involving PDL students and one involving an SPC student.

In some cases, the inadequacy of range facilities (see Chapter 1) was noted as a contributing factor in some of the range accidents. The facility at one pilot test site in the Summer was extremely large, and communication devices were not adequate to cover the entire area. In addition, the surface was degraded—that is, lines painted on the pavement were difficult to see. Some of the other range facilities used throughout the project were too small.

Training consultants attributed the accidents to a number of contributing factors: (a) inadequate instructor experience in conducting range lessons; (b) the pace of instruction, which may have exceeded the learning pace for many students; and most importantly, (c) lack of individualized instruction.

In the Fall semester, there were six range accidents, four of which involved PDL students; in the Spring semester, two range accidents (one SPC and one PDL) and one on-street accident involving an SPC student. Three range and five on-street accidents occurred during the project when instructors were driving project vehicles. The total estimated cost of repairs for all damaged vehicles was $5,500.00.

Management and Administration

The project had an extensive personnel turn-over at both the administrative and operational levels, which undoubtedly caused a lack of continuity as the project progressed. Problems associated with changes in personnel can be eased by having back-up personnel available (especially at the administrative or managerial level) and by requiring adequate documentation of project activities on a day-to-day basis.

The diverse geographical locations of primary decision makers and a lack of daily interaction with on-site staff probably also accounted for some of the difficulties experienced in management and coordination of project activities. The prime contractor, Human Resources Research Organization (HumRRO) is located in Washington, D.C.; the subcontractor, Central Missouri State University (CMSU) is located in Warrensburg, Mo.; and the pilot test location, Kansas City, Mo., was approximately 60 minutes from Warrensburg. On-site (Kansas City) personnel occasionally had difficulty in obtaining supplies and equipment. Determining whom to contact when a problem arose was difficult, since both the subcontractor and prime contractor shared responsibility.

The distance of the on-site office from the contractor and subcontractor representatives probably contributed to the problems. However, most of these difficulties could have been averted if a clear delineation of responsibilities had been established.

Some specific areas of responsibility on a project like this one are outlined here:

(1) Data collection and analysis
(2) Curriculum development and revision
(3) Testing/monitoring
(4) Fiscal/personnel
(5) Selection/training of personnel
(6) Equipment/facilities
(7) Accounting/recording requirements

In some areas, responsibility must be shared by the prime contractor and subcontractor or by several organizations or individuals. Most importantly, the mechanism for shared responsibility and decision-making must be clearly established.

Daily, on-site management of project activities also proved to be a problem.[1] It was only in the later stages of the Fall, 1973 pilot test that an on-site project director with a research background was employed. In future efforts, it is recommended that research personnel be on-site throughout the duration of the project. This is especially critical at the outset of the project to provide uniform procedures for testing, test administration, revision, and monitoring of data.

Comments from instructors indicated that on-site managerial personnel did "not know what their responsibilities were," and that it was important to have someone who was "totally familiar with the curriculum on-site every day to supervise the implementation and provide guidance."

Comments from two instructors are presented here:

> "In principle, the project's administrative set-up is great, but in reality it didn't work. One problem we had was in conflicting instructions coming from on-site managerial personnel, and in several cases, the instructions were given to the wrong person—a team member (instructor) or project aide, rather than the team leader . . . "
>
> "To this day (end of Spring semester, 1974) I'm still not sure what the job duties of the curriculum administrator, team leaders and project aides were. It's been put in writing, but what was really needed was a line of command, which I'm sure was set up but a lot of times was not followed through. All of the people in this set-up need to work together and *on-site* most of the time. When a problem develops, you need an answer *then*, not an hour or a day later . . . "

The same recommendation, made for the project's administrative personnel, can be made for managerial personnel on-site: establish a clear delineation of responsibilities.

Public Relations

Appropriate communication procedures must be established for the orderly implementation of a project. Ideally, project staff, school administrators, and parents should interact and share information on the purpose, objectives, and requirements of the project.

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[1] Project staffing requirements on-site are detailed in Appendix K.

An example of what might have been a problem in the public relations area in this project was parental response to the random assignment process. From the start, however, it was anticipated that parents of some students assigned to the "No Formal Instruction" group would attempt to work their offspring into one of the curriculum groups. When this problem arose, it was offset by a reminder to parents that the conditions of the program were outlined at the beginning, that every student had a fair chance, and that it would be inequitable to make substitutions at this time. Some parents requested that their child, failing to be selected for one semester, be assigned to the next. It was pointed out to them that such an arrangement, if extended to everyone, would populate later classes with students who were not selected for earlier classes and would thus deprive younger students, just becoming eligible, of any chance whatever at selection.

There were some cases in which parents of students selected for the Pre-Driver Licensing course wanted their children placed in the Safe Performance Curriculum. These parents, concerned that the PDL course (which is shorter and contains substantially less content than the SPC) would not be as effective as the SPC, were assured that neither course had proven to be more effective than the other, and that their child would receive the instruction necessary to qualify him for a license.

Chapter 4

DESCRIPTION OF INTERMEDIATE CRITERION INSTRUMENTS

The instruments used in this study consisted of various types of intermediate criterion tests. As listed in Chapter 3, these tests included:

- Driving Knowledge Pre/Post-Test
- Unit Knowledge Tests
- Perceptual Skills Test
- Basic Skills Range Test
- Evasive Range Test
- On-Road Performance Test
- Attitude Measure

DRIVING KNOWLEDGE PRE/POST-TEST

The 50-item pre-test and post-test of driving knowledge was developed from the moderate- to high-criticality knowledge objectives covering the entire Safe Performance Curriculum. Its function is to (a) assess overall student attainment of curriculum objectives, which helps to determine the general effectiveness of the curriculum, and (b) identify specific deficiencies in curriculum requirements and course materials.

The pre-test was administered to both PDL and SPC students during Unit 1 instruction, before students had any contact with the actual driving content covered in the course. The post-test was administered on the last day of classroom instruction for each course.

In the specific research application for which the test was developed, the overall test was divided into two subtests, or forms, in order to reduce the amount of class time required for test administration. One of the forms (25 items) was randomly assigned to each student for the pre-test. In order to improve test reliability, however, all 50 items (both forms) were administered for the post-test.

Each of the two forms (A and B) of the Driving Knowledge Test consists of 25 items. The distribution of items per unit of instruction is as follows:

Unit	Number of Items
2	2
3	7
4	5
5	2
6	2
7	4
8	3

Each curriculum unit is represented in rough proportion to the volume knowledge content in that unit. Items that tested the high-to-moderately-high criticality knowledge objectives of the Safe Performance Curriculum were selected from two basic sources: (a) the Driving Knowledge Test of the *Driver Education Task Analysis: Instructional Objectives* (DETA:IO)[1] and from the Driver Knowledge Test Item Pool,[2] developed by the Highway Safety Research Institute (HSRI). When distractors (multiple choice items) appeared inadequate, they were rewritten. When neither of these sources provided a suitable item for testing attainment of a high criticality objective, a new item was generated.

The following information is presented in Appendix A for all of the items on the Pre/Post-Tests: (a) the number of the LAP that contains the information the item is intended to measure; (b) the criticality rating of the related driver task (HC—High Criticality, MHC—Moderately High Criticality, MC—Moderate Criticality, MLC—Moderately Low Criticality); and (c) the original source of the item (DETA:IO); HSRI; or New).

On the basis of data obtained from administration of the Pre/Post-Test during the Spring semester, some of the items were revised. The revised test appears in the *User Guidelines*, final report, (10). Items considered for revision were the ones that were answered incorrectly by more than 50% of the students taking the post-test or that had extremely low item total correlations. Items were retained in their original form if re-examination of the instructional materials showed that substantial emphasis had been given to information leading to the correct answer. In some cases, instructional materials were revised. Post-Test data were also checked for confusing or difficult language and misleading distractors. Items were modified when it was felt that students who had read the LAP materials would still have had some logical justification for choosing one of the "incorrect" distractors. Response distributions indicated which distractors needed to be made "more attractive" (i.e., the distractor was obviously wrong) or "less attractive" (e.g., students may have chosen the distractor more often than the "right" answer). On Form AB, items 5, 7, 24, 35, and 39 were revised.

Test administration guidelines and scoring procedures for the Knowledge Test are provided in Appendix A.

UNIT KNOWLEDGE TESTS

In the first pilot test implementation, SPC students were tested on a module (or LAP) basis. (PDL students received tests for only LAPs 2-1 and 2-2.) SPC students, then, received 19 tests throughout the course, in addition to the other intermediate criterion measures. It was decided, therefore, to reduce the amount of testing by designing "unit" tests,[3] which would measure student attainment of the moderate to high-criticality objectives within each unit. The unit tests are administered as post-tests to each unit—that is, after the student has received classroom instruction (which includes clarification of material presented in the LAPs) for each unit.

The Unit Knowledge Tests appear in Appendix B, with a criticality rating and source provided for each item. Test administration and scoring procedures also appear in this appendix.

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[1] Driver Education Task Analysis, Volume III: Instructional Objectives (8).

[2] W.G. Berger, *et al., A Handbook for Driver License Knowledge Tests. Part II: Test Item Pool*, Highway Safety Research Institute, University of Michigan, October 1971.

[3] Students are still tested on a module (or LAP) basis in Unit 2, since the two modules within that unit are not dealt with consecutively. That is, students are not tested on the second module in Unit 2 until later in the course, since the driving tasks covered in that module—parking, U-turns, etc.—are practiced after the student has had on-street experience.

On the basis of data obtained from the administration of the Unit Knowledge Tests during the Spring term, some of the items were revised. Four of the item/total correlations were sufficiently low ($r = .20$) to warrant revision of the corresponding items. For each of the four items, data were available indicating the distribution of choices among each of the four alternatives. On the basis of these percentages, distractors that were apparently too difficult, confusing, or obvious were identified and rewritten. Revisions were made to Item 10, LAP 2-1; Items 1 and 11, Unit 3; and Item 10, Unit 8. Revised Unit Knowledge Tests appear in the Appendices to each unit of Instructor Materials, *User Guidelines*, final report (10).

PERCEPTUAL SKILLS TEST

In the Safe Performance Curriculum, the emphasis in measurement of student understanding in the perceptual skills area is not on "informational" content, but rather on perceptual abilities needed to respond to other road users and to hazards. For this reason, the evaluation measure for this segment of the course is provided through "moving," real-world traffic scenes.

The Perceptual Skills Test film (16mm) portrays 10 situations requiring (a) judgment of the distance/time needed to safely maneuver the car (e.g., in passing, crossing an intersection) in complex situations, or (b) a response to subtle hazards presented in the film.

Students respond to the situations by checking an answer sheet "safe" or "unsafe" (e.g., to pass), based upon their perception of the traffic scene portrayed.

The test (see Appendix C) represents a sampling of the high-criticality objectives[1] for Unit 5, "Complex Perceptual Skills." The Perceptual Skills Test is administered in the last session of Unit 5 classroom instruction.

BASIC SKILLS RANGE TEST

The Basic Skills Range Test (see Appendix D) is administered as a measure of basic control skill, not because basic control skill by itself is highly critical to vehicle safety, but because it underlies the development of other critical skills.

Specific tasks dealing with basic control skills were derived from the Task Analysis (6). The tasks measured in this particular test are basically an outcome of those tasks covered in the first three range lessons of the course. Specific instructions for the methods employed and the range layouts for this test may be found in range lessons SR1, SR2, and SR3, provided in the Instructor Materials, Unit 2, which accompany the *User Guidelines*, final report, (10).

The test is intended to assess the following skills:

(1) Acceleration—the ability to coordinate brake, accelerator and gearshift in moving the car forward.

(2) Tracking—the ability to maintain a straight path.

(3) Turning—the ability to coordinate speed and steering to follow a specified path.

(4) Speed control—the ability to maintain a specified speed, with and without recourse to the speedometer.

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[1] *The Driver Education Task Analysis, Volume I: Task Descriptions,* (6) rates each task in terms of criticality.

(5) Decelerating—the ability to bring the vehicle to a smooth, safe, nondisruptive stop.

(6) Lane changing—the ability to control speed and positioning.

In each of these performances, it is primarily the perceptual-motor control "skill" that is to be assessed. The range is not used to assess knowledge that may be more readily evaluated through knowledge tests.

The Basic Skills Range Test is administered after LAP 2-1 classroom, simulator, and range experiences. It is the student's fourth formalized exposure to the range. The test is administered in an off-road area, under conditions in which performance is not affected by variation in roadway conditions, traffic, or general physical environment.

EVASIVE RANGE TEST

In addition to its use in assessing basic control skills, a driving range is also used to assess skill in dealing with emergency situations that do not occur frequently enough in normal driving and are too hazardous to stage on the public highway.

The Evasive Range Test (see Appendix E) is confined to the assessment of those emergency skills that are included among the instructional objectives, derived from the Task Analysis (8), for the Safe Performance Curriculum.

The primary source of information for the development of the Evasive Range Test was the *General Motors Advanced Driver Education Course Training Manual.*[1] This document was also used in the development of the range lessons which precede the Evasive Range Test. The GM maneuvers were refined and modified to a considerable extent, based upon the restrictions imposed by the range facilities available at the pilot test site. Specific methods and range layouts for the Evasive Range Test are provided in range lessons SR10, SR11, and SR12, included in the SPC Instructor Materials, Unit 7, which accompany the *User Guidelines*, final report (10).

Maneuvers for the Evasive Range Test include (a) a serpentine course, (b) blocked lane, and (c) controlled braking and steering. Each student driver is scored twice on each maneuver. Off-road recovery is dealt with in an on-street lesson in a low-volume traffic area. The purpose of conducting this maneuver on-street is to improve the student's confidence in his ability to perform emergency maneuvers in a real-world operating environment.

ON-ROAD PERFORMANCE TEST (ORPT)

The purpose of the On-Road Performance Test (see Appendix F) is to assess the student knowledges, perceptual skills, and habits underlying the performance of relatively normal driving tasks. The test is designed primarily to assess student attainment of objectives in the Safe Performance Curriculum, particularly the objectives of Unit 3, "Normal Driving" and Unit 5, "Complex Perceptual Skills." To the extent that performances are observed under conditions of adverse weather conditions, the test also assesses objectives of Modules 4-1, "Limited Traction" and 4-2, "Limited Visibility."

The goals of the On-Road Performance Test may be defined by exclusion. The test is not designed to assess manipulative abilities involved in basic vehicle control (Unit 2) or emergency skills (Unit 7). These skills are best assessed on off-road areas where the precision of the driver's control skill can be assessed more readily with the aid of devices ranging from simple traffic cones to standardized rating procedures. Nor is the On-Road Performance Test intended to assess complex perceptual skills and emergency decision-making skills that involve infrequently-encountered traffic patterns. These objectives appear more amenable to assessment through visual simulation techniques. Finally, the On-Road Performance Test is not intended to assess attainment of objectives that relate to off-road activities such as use of alcohol (Unit 6), Breakdowns and Accidents (Module 8-1), Maintenance and Servicing (Module 8-2), Trip Planning (Module 8-3), and System Improvement (Module 8-4).

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[1] General Motors Corporation. *General Motors Advanced Driver Education Course Training Manual*, General Motors Proving Ground, 1971.

The following maneuvers represent those performances selected from the objectives in Units 3 and 5 of the curriculum for inclusion in the On-Road Performance Test:

Normal Transit
Curves
Through intersection
Parked cars
Uphill
Downhill
Pedestrians
Bridge
Merge
Entering and leaving traffic
Left and right lane changes
Being passed and judgment for passing
Off-ramp (or exit)
Underpass

Definitions for each of these maneuvers are presented in the Administrator's Guide, Appendix F.

Route Selection

In selecting routes for the On-Road Performance Test, street maps were studied to determine possible routes. Those with urban, rural, and freeway characteristics were selected and driven to identify specific areas where maneuvers could be checked. (A major concern was to select a route that covered the urban, rural, and freeway areas and to select areas where the maneuvers could be checked.) In selecting the route, it is important that a sufficient number and variety of maneuvers be included, but not so many that the test administrator is "overloaded."

In the Spring administration of the On-Road Performance Test, checks were made on approximately 35 maneuvers. (Some maneuvers were rated three or four times throughout the course of a half-hour test.) However, instructors appeared to be "overloaded," which made it necessary to make minor changes in test administration to accommodate the problem.

Test Development

The On-Road Performance Test was developed during the Fall, 1973 semester. Instructors found the initial format difficult to score, since the elements or variables within each maneuver varied (e.g., lane change included the following elements: signal, mirror check, shoulder check, side gap acceptance; standard left turn included signal, initial lane position, traffic check, maneuver, and final lane position). (Figure 6 is a sample of the format used for a Standard Left Turn in the Fall Pilot Test.)

Because of the difficulty raters experienced in scoring the test in the Fall semester, the number of elements the test administrator had to score were reduced in the Spring

SAMPLE FORMAT ON STANDARD LEFT TURN FOR SCORING ON-ROAD PERFORMANCE TEST, FALL PILOT TEST

1. Signal	0. N/A __	1. OK __	2. Late __	3. Early __
2. Initial Lane Position	0. N/A __	1. OK __	2. Incorrect __	3. Other __
3. Traffic Check	0. N/A __	1. OK __	2. Incorrect __	3. Other __
4. Maneuver	0. N/A __	1. OK __	2. Too Sharp __	3. Too Wide __
5. Final Lane Position	0. N/A __	1. OK __	2. Incorrect __	3. Other __

N/A: Not applicable.

Figure 6

semester. Instead of varying elements within each maneuver, the same seven elements were used in scoring every maneuver. These elements are: path, position, speed, signaling, observing, traffic control, and task (general evaluation of overall performance on the maneuver). A sample of the format used for each maneuver in the Spring Pilot Test is shown in Figure 7.

SAMPLE FORMAT FOR SCORING ON-ROAD PERFORMANCE TEST, SPRING PILOT TEST

Maneuver ______________________ Item # ______________________

Cue Student ____

Scoring Interval ____

	SCORE			
Var. No.	Variable Name	P	F	n/a
1.0	Path.			
1.1	Position.			
2.0	Speed			
3.0	Signaling			
4.0	Observing			
5.0	Traffic Control .			
6.0	Task.			

Rater's Comments:

NOTE: P=pass, F=fail, n/a=not applicable.

Figure 7

Items are numbered (see Figure 7, "Item #") in the sequence in which they occur (e.g., Item #1 is Pre-Operative Procedures; Item #2 may be Left Turn, depending on the route; the last item would always be Shut-Down). The number of maneuvers for a specific route will vary, depending on the time allotted for the test and the maneuver potential available on the test route. Each student is rated on approximately 35 maneuvers (25 - 30 minutes driving time per student).

> Note: Test administration in the pilot test took place within a one-hour session, during which two students were tested. The first student drove the "outbound" route, which ended approximately 25 minutes away from the test site; the second student drove the "inbound" segment, which ended back at the site.

Information given on the "cue student" line (see Figure 7) tells the test administrator *where* to cue the student and *what* to tell the student, for example, "At the fire hydrant on Smith Street *(direction to instructor)*, Turn right at the next street *(cue to student)*."

The "Scoring Interval" defines the area in which the rater scores the driver. Scoring intervals are included in the definitions for each of the maneuvers, Appendix F.

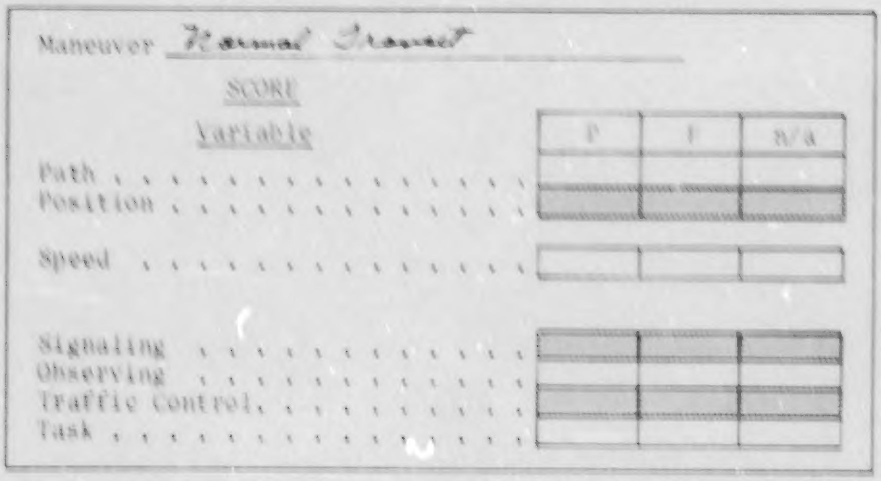
Definitions for each of the variables and for "pass (P)," "fail (F)," and "not applicable (NA)" are described in general terms under Definitions of Terms Used in Format, appearing later in this chapter. Definitions for checks broken out by specific maneuvers are in the Administrator's Guide (Appendix F), together with route selection and test administration guidelines. Each student was required to handle, on the average, 35 maneuvers. Combined with the seven variables within each maneuver, the total number of checks for each student during a half-hour test was approximately 210.

Comments from instructors indicated that the scoring requirement in the Spring pilot administration of the test still "overloaded" the instructor (rater), even with the revised format. Rater overload results not only because the rater (instructor) has too many maneuver checks, but also because the rater is required to monitor the student driver to ensure safe performance. That is, the rater must be able to respond to student errors which may result in an accident.

Thus, it was necessary to make changes in rater procedures during the course of the Spring administration of the test. Two elements (decelerating and accelerating) were dropped from the test, since there appeared to be some confusion over their definitions. Instructors were spending too much time during test administration in rating these elements. In addition, to reduce the overload, instructors were told to check only those elements that the student "failed." This saved a considerable amount of time in rating since instructors did not have to check elements the student "passed" or those that were "Not Applicable."

The present format for scoring the On-Road Performance Test, while useful for research purposes, is most likely too detailed for administration on an ongoing program basis. Comments by instructors indicated a need to reduce the number of maneuvers checked and to provide more specific (operational) checks for a maneuver. These changes would result in a format similar to the one used in the Fall Pilot Test (Figure 6). The scoring requirements would be somewhat reduced by providing route-specific elements within maneuvers. One way of revising the present format would be to omit variables that do not apply to certain maneuvers (e.g., for "Normal Transit," the variables Position, Signaling, and Traffic Control would not normally be scored). These variables could simply be "blackened out" on the score sheet, as shown in Figure 8, during route selection. The score sheet itself could also be designed to be route-specific (see Figure 9).

SUGGESTED REVISION OF PRESENT FORM FOR SCORING ON-ROAD PERFORMANCE TEST



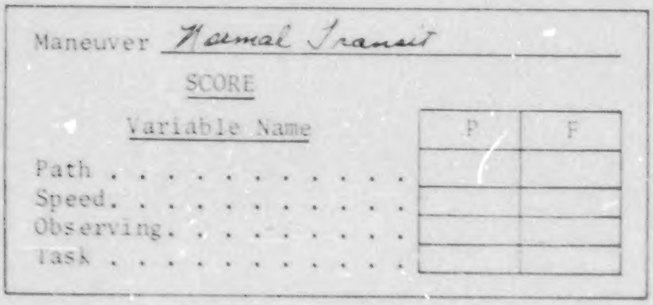
Maneuver *Normal Transit*

SCORE

Variable	P	F	N/A
Path			
Position	▨	▨	▨
Speed			
Signaling	▨	▨	▨
Observing			
Traffic Control.	▨	▨	▨
Task			

Figure 8

SUGGESTED SCORE SHEET USING ROUTE SPECIFIC FORMAT FOR SCORING ON-ROAD PERFORMANCE TEST



Maneuver *Normal Transit*

SCORE

Variable Name	P	F
Path		
Speed.		
Observing.		
Task		

Figure 9

Definitions of Terms Used in Format

Pass. A student's performance on a task or element of a task that the rater judges as safely executed.

Fail. A student's performance on a task or element of a task that the rater judges as *not* minimally skillful, or *not* safely executed (further defined in "Definitions for Maneuver Checks").

Not Applicable. A task or task element listed on the test score sheet that could not be scored either Pass or Fail because (a) the task was interrupted by the need to respond to an emergency or hazard; (b) a task, by definition, did not contain a given scoreable task element (which would not occur if the test format were made "route specific," i.e., those variables that do not apply to a specific maneuver are deleted prior to test administration); or (c) the conditions requiring student response did not occur (e.g., the student could not respond to parked cars or pedestrians because none was in the area programmed for these maneuvers).

Path. The ground path, lateral and longitudinal, taken by the vehicle through a period of time. This includes forward and backward motion and turns. Gap acceptance is also scored under "Path." If a student does not enter an acceptable gap in the course of a maneuver (e.g., left turn with oncoming traffic), or if he enters an unsafe gap, the student fails "Path."

Position. The lateral and longitudinal location of the vehicle when it is stopped (e.g., at a STOP sign, the car's front should not extend into the intersection, and the car should not extend into an adjacent lane). Position should only be scored when the vehicle is at a stop.

Both Path and Position would be scored during a single maneuver if the driver were required to stop during the task, for example, Left Turn with Oncoming Traffic.

Speed. The value indicated by the car's speedometer throughout the scoring interval. In most instances, the student would be marked "Fail" for exceeding the speed limit by more than 3-4 mph, or for driving so slowly that he creates a hazard. The student would be scored "Pass" for the speed variable by decelerating, accelerating, or maintaining a steady speed when appropriate, that is, traveling at a speed that is safe and appropriate for existing conditions.

Signaling. Hand and/or automatic direction change indications, including manual cancellation of automatic signals. (For example, a student who signals for a turn too early or omits the signal for a turn would fail on this variable.)

Observing. Obvious movements of the eyes, head, and shoulders which the rater identifies as part of the driver's visual searching behavior. Braking, covering the brake, or evasive steering in the presence of a hazard or as a response to the movement or signals of other vehicles would indicate that the student was "observing" properly.

Traffic Control. Responses to signals, signs, police, firemen, barricades, etc.

Scoring Procedures

An overall "score" is the proportion of situations successfully passed—that is:

Correct responses ÷ (correct responses + incorrect responses)

While this proportional scoring system accounts for the differences in the *number* of situations each driver faces, it does not accommodate differences in the *nature* of the situations. Qualitative distinctions would be too voluminous for the instructor to record. Since qualitative distinctions cannot be made, the analysis of the data presented in Chapter 5 is confined to group comparisons as each student is exposed to a different set of situations.

Test Administration Procedures

Administration of the On-Road Performance Test involves directing the driver over the specified route and recording his or her responses. Detailed guidelines for scoring student responses are provided in the Administrator's Guide, Appendix F.

In order to provide a valid assessment of skill level, the administrator must not provide instructions other than those required for administration of the test. An objective evaluation of students' performance involves proper preparation of the administrators—explaining the objectives of the test and the administrator's role in fulfilling them.

"Blind" Raters. Pilot test instructors served as administrators for the On-Road Performance Test. In order to remove any bias that might have resulted if the instructors rated the students they had taught throughout the semester, the instructor team from

Site A administered the test at Site B, and *vice versa*. Eight students (four SPC and four PDL) per hour were tested at each site (four raters, two students per car). Students were assigned alphabetically to take the test. The eight student names were called out at random, each rater taking two students. Thus, one rater may have had two SPC students, another rater may have had a PDL and an SPC student, etc. The raters did not know whether a student had had the PDL or SPC course. (Student permits, which instructors were to have in their possession when on-street with a student driver, were sealed in an envelope.)

Selection Criteria

For reasons of safety, minimum requirements in driving experience were set to determine which students could take the On-Road Performance Test. (Students would be exposed to real-world traffic conditions—e.g., merging and exiting on freeways.) The need to identify unprepared students was especially critical in the PDL course since PDL students had not received the comprehensive range and on-street instruction. The following minimum requirements for selecting students for testing were established: (a) at least three hours of basic range instruction, (b) at least two hours of on-street instruction, and (c) judgment of the instructor that the students were adequately prepared. These criteria resulted in a 10.7% sample reduction for PDL (11 students did not meet the first two criteria, and eight students were judged by instructors as being inadequately prepared). All students in the SPC group met minimum requirements. In conducting the actual test, less than 2% of the tests were aborted as a result of student inability to perform, indicating that the preselection criteria appeared to be effective in predicting ability to perform.

ATTITUDE MEASURE

A valid assessment of attitudes in an educational situation, where grades are at stake, may be difficult to obtain. The student is more likely to indicate his attitude as one he thinks the instructor is looking for rather than to describe his actual attitude. As a result, an "attitude measure" may be, in reality, a measure of social perceptiveness, verbal intelligence, technical sophistication, or some other attribute.

One method of overcoming this response is to disguise the intent of the attitude measure through the use of a pseudo-knowledge item—in this case, to disguise the fact that attitudes are at stake. This requires the respondent to interpret the item on the basis of some nonattitudinal determinant, such as logical reasoning, knowledge, or information. To the extent that the test does, in fact, contain elements of reasoning and knowledge, the attitudinal component is correspondingly reduced.

There are several techniques for generating pseudo-knowledge items. Answer alternatives beyond the comprehension of the respondents or all equally erroneous may be generated. Questions so ambiguous or incomplete as to preclude the possibility of a correct response may be generated. All these approaches were used in developing items for the Attitude Measure (pseudo-knowledge test) used in the pilot test.

A set of 20 pseudo-knowledge items was generated out of instructional content drawn from all phases of the curriculum. Each item presents a lead phrase followed by three alternative answers. Each answer is worded so as to reflect what appears to be different value judgments concerning safety issues. Here is an example:

1. Pulling away quickly:
    a. Is a waste of gas
    b. Can sometimes cause an accident
    c. Is a sign of an unsafe driver

Someone who considers that pulling away quickly is "a waste of gas" does not necessarily believe the activity is particularly unsafe. The other two alternative responses should reflect a greater safety-conscious orientation on the part of a student.

The complete set of 20 items constituting the preliminary form of the pseudo-knowledge test, referred to as the "General Driving Knowledge Test," and the subsequent revisions to the items appear in Appendix G-1, and G-2. The items were submitted to a panel of 16 driver education teachers and researchers who were asked to rank the three alternative answers to each question in the order of the safety-consciousness they reflected. The distribution of rankings was essentially in accord with the hypotheses for each item. Those items that were not in accordance were discarded or revised.

The first revision of the 20-item test was administered to a group of 186 students completing driver education at James Robinson High School in Fairfax, Virginia. It was assumed that driver education students would provide the most rigorous test of item discrimination potential, since their attitudes might be expected to be the most homogeneous. Of the 20 items, 11 provided a reasonable distribution of responses, that is, no response category was selected by less than one-tenth of the group nor by any more than two-thirds of the group. The nine unacceptable items were again revised to make answer alternatives more or less attractive in accordance with response frequencies recorded below one-tenth or above two-thirds, respectively.

The nine revised items were administered to a group of 100 students attending driver education courses in Prince Georges County, Maryland. The results of the second revision appear in Appendix G-1. Seven of the revised items conformed to the "one-tenth/two-thirds" criterion prescribed above. The remaining two items were revised again and submitted to another group of 100 students at James Robinson High School. The results of this third revision appear in Appendix G-1. Both of these items were retained on the basis that two alternatives in each item exhibited a high level of discrimination.

The final version of the "General Driving Knowledge Test" (Appendix G-2) was administered to students in both the Safe Performance Curriculum and the Pre-Driver Licensing course. The results provided impressionistic data on attitudinal differences between SPC and PDL students with respect to each item. Twenty-five items from the Mann Inventory[1] were included in the final version of the "General Driving Knowledge Test" in an effort to provide attitudinal data from more traditional approaches. Items were selected which related directly to driving. Response distributions of SPC and PDL samples appear in Appendix G-2.

Obviously nothing can be said regarding the psychometric properties of the instrument at this time. Whether a particular response configuration constitutes a "safety-conscious" attitude toward driving can only be determined by validation studies employing real-world driving behavior criteria. The results presented in this report should be considered exploratory and interpreted with caution.

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[1] F.C. Kenel, "The Effectiveness of the Mann Inventory in Classifying Young Drivers Into Behavioral Categories and Its Relationship to Subsequent Driver Performance," unpublished doctoral dissertation, Michigan State University, 1967.

Chapter 5

RESULTS: INTERMEDIATE CRITERION MEASURES

DRIVING KNOWLEDGE TEST

Reliability

The 50-item driving knowledge test was originally divided into parallel forms of 25 items each. These forms, designated A and B, were randomly assigned to students on the pre-test, some of the students receiving Form A, others Form B. The internal consistency of the two forms was demonstrated by the Kuder-Richardson Formula 20 (KR-20) statistic. These results are: Form A—.48, and Form B—.65.

Since these coefficients were moderately low, the two forms were combined to produce a more reliable 50-item post-test. To ensure that the order of presentation of the forms did not affect results, the two forms were administered in random order. Therefore, the remaining reliability and content analyses make a distinction between *AB* and *BA* forms of the test. Although reliability estimates are more appropriate for pre-tests (since instruction could not possibly influence the results), reliability estimates for post-tests are given as a rough estimate of the increase in reliability from a 25-item to a 50-item test.

Reliability estimates on the post-test, as demonstrated by KR-20, were .86 for Form AB and .87 for Form BA. These reliability coefficients, moderately high for a 50-item test, show a considerable increase (slightly in excess of Spearman-Brown formula expectation) over Form A (.48) and Form B (.65) in the pre-test. There is also very little difference in the two forms of test presentation. Complete item-total correlations can be found in Appendix H.

The overall results of the combined 50-item post-test are summarized in Table 3. It is again demonstrated that there is no significant difference in the order of presentation of the two forms.

Table 3

Results of 50-Item
Driving Knowledge Post-Test

	Form AB	Form BA
Mean	32.5	32.2
Standard Deviation	7.9	8.0
Median	33.1	32.3
	$t = .75$	

Content Analysis

Table 4 presents an analysis of post-test results, divided into conceptual areas of the driving task. Following each of the conceptual areas are the items by number in that category. The two columns on the right indicate the number of items in the category that were answered correctly either less than or greater than 50% of the time. This presentation identifies areas of low content acquisition by students. The only area in which major difficulties appeared was in the unit "Environmental Factors." In all other areas, more than 50% of the items were correctly answered by more than 50% of the students. Only very slight differences between the two test forms were discernible.

Table 4[a]

Analysis of Knowledge Post-Test Results, by Conceptual Areas

Conceputal Area/Item Number	Number Items ≤50% Correct	Number Items ≥50% Correct
Form AB		
Basic Control Tasks (Items 1, 2, 26, 27)		4
Normal Driving (Items 3-9, 28-34)	3	11
Environmental Factors (Items 10-14, 33, 36-39)	6	4
Complex Perceptual Skills (Items 15, 16, 40, 41)		4
Driver Influences (Items 17, 18, 42, 43)		4
Emergency Skills (Items 19, 22, 44-47)		8
Nonoperational Tasks (Items 23, 25, 48, 50)	2	4
Total	11	39
Form BA		
Basic Control Tasks (Items 1, 2, 26, 27)		4
Normal Driving (Items 3-9, 28-34)	3	11
Environmental Factors (Items 10-14, 35-39)	6	4
Complex Perceptual Skills (Items 15, 16, 40, 41)		4
Driver Influences (Items 17, 18, 42, 43)		4
Emergency Skills (Items 19, 22, 44-47)	1	7
Nonoperational Tasks (Items 23-25, 48-50)	1	5
Total	11	39

[a] Items numbered 1-25 in Form AB are the same questions as those numbered 26-50 in Form BA. Similarly, those numbered 26-50 in Form AB are the same as 1-25 in Form BA.

In Table 5, the analysis is expanded to show the results for each individual item. Question 6 in Form AB (31 in Form BA) proved to be the most difficult. This question was stated as follows:

> When you are planning to make a turn at an intersection, the best time to signal your turn, in most cases, is:
>
> a) as soon as you've decided to make the turn
> b) whenever it will cause the least confusion
> c) approximately 100 feet from the intersection
> d) when you begin to make the turn.

Table 5

Analysis of Knowledge Post-Test Results, by Item, for Each Conceptual Area

Conceptual Area	Item Numbers			
	0-20% Correct	21-50% Correct	51-70% Correct	71-100% Correct
Form AB				
Basic Control Tasks			26	1, 2, 27
Normal Driving	6	5, 7	30, 32, 34	3, 4, 8, 9, 28, 29, 31, 33
Environmental Factors		12, 14, 35, 37-39	11	10, 13, 36
Complex Perceptual Skills			40, 41	15, 16
Driver Influences			42, 43	17, 18
Emergency Skills			19-22, 46	44, 45, 47
Nonoperational Tasks		24, 25	48, 50	23, 49
Form BA				
Basic Control Tasks				1, 2, 26, 27
Normal Driving	31	30, 32	7, 9, 28	3-6, 8, 29, 33, 34
Environmental Factors		10, 12-14, 37, 39	11, 35, 36	38
Complex Perceptual Skills			15, 40, 41	16
Driver Influences			17	18, 42, 43
Emergency Skills		45	21, 44, 46, 47	19, 20, 22
Nonoperational Tasks		49	23, 50	24, 25, 48

Answer b) is the correct one, but approximately 79% of the students marked c). This high response rate can probably be attributed to the students' awareness of the fact that in most states, signaling is recommended at 100 feet before the intersection. However, the instructional objectives in the Safe Performance Curriculum (SPC) were to provide students with an awareness of more general safety principles.

Responses to the other items were considered acceptable.

Pre/Post-Test Results

Table 6 presents the percentage of correct responses on the pre-tests and post-tests.

In addition to a breakdown by curriculum and sex, the table shows a breakdown of the sample into "upper" and "lower" achievement levels, based on grade point average. Results from these breakdowns show some significant differences within the sample. Males scored consistently higher than females, and males and females in upper levels scored higher than males and females in lower levels. These trends appear in both pre-test and post-test results. Students in the SPC scored generally better than those in the PDL course, even in the pre-test, though the differences were more pronounced in the post-test. In both curricula, however, a noticeable improvement was detected in the post-test.

Since pre-test biases between PDL and SPC were observed, the analysis of covariance was employed to adjust the post-test means, using the pre-score as the covariate. The

Table 6

Mean[a] Percent Correct on Knowledge Pre/Post-Tests, by Student Group,[b] Achievement Level,[c] and Sex

Test/Achievement Level	PDL Group		Total	SPC Group		Total
	Male	Female		Male	Female	
Pre-Test						
Upper	58.8 (n = 50)	52.0 (n = 75)	54.7	62.4 (n = 41)	57.2 (n = 78)	59.0
Lower	53.2 (n = 22)	47.2 (n = 30)	49.7	50.0 (n = 34)	49.2 (n = 38)	49.6
Total	57.1	50.6	52.3	56.8	54.6	55.4
Post-Test[d]						
Upper	68.2	60.6	63.6	76.2	72.6	73.8
Lower	54.4	51.4	52.7	64.0	59.8	61.8
Total	64.0	58.0	60.4	70.7	68.4	69.3

[a] Statistically adjusted using pre-score as the covariate.

[b] The two student groups in the curriculum design (as mentioned in this and subsequent tables) are those receiving the Pre-Driver Licensing course (PDL) and those receiving the Safe Performance Curriculum (SPC).

[c] Achievement level, Upper and Lower (in this and subsequent tables), indicates whether students are in the upper or lower half of their class scholastically.

[d] Sample size for the analysis is the same as for the pre-test.

adjusted means were then submitted to a factorial unweighted means analysis.[1] The results of the analysis are presented in Table 7.

Table 7 indicates highly significant effects for two factors. The major differences appear to be between curricula ($p < .01$), with significant differences also between upper and lower rank in class ($p < .01$). There is no significant difference by sex on the knowledge post-test. There are also no significant interactions among curriculum, achievement level, or sex.

Although the SPC students had significantly higher scores than the PDL students, the overall pass rate was relatively low, with 69% for SPC and 60% for PDL. Similar content acquisition scores are evidenced in other driver education studies. For example, in a study conducted in San Diego using driver education students, several groups who were provided with different methods of instruction scored from 71 to 76 percent on knowledge tests.[2] In another study with U.S. Coast Guard recruits, knowledge test scores ranged from 33 to 82 percent.[3] While direct comparison cannot be made because of

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[1] The unweighted means analysis was used because of unequal n's. (Winer, B.J. *Statistical Principles in Experimental Design*, McGraw-Hill, Inc., New York, 1971.)

[2] Thomas A. Seals and Charles E. McDaniel. *An Appraisal of Traditional and Selected Multi-Unit Driver Education Courses*, prepared by the Department of Education, San Diego, California, for the California Office of Traffic Safety and the National Highway Safety Bureau, August 1970.

[3] John A. Whittenburg, *et al. Driver Improvement Training and Evaluation*, prepared by The American University, Washington, D.C., for the National Highway Traffic Safety Administration, U.S. Department of Transportation, May 1972.

Table 7

Analysis of Variance for Driving Knowledge Post-Tests

Source	*df*	*MS*	F^a
Curriculum	1	1423.00	38.62**
Level	1	1009.64	27.40**
Sex	1	96.97	2.63
Curriculum X Level	1	.81	<1
Curriculum X Sex	1	.98	<1
Level X Sex	1	1.74	<1
Curriculum X Level X Sex	1	60.95	1.65
Error (Within Cell)	359	36.85	

[a]** Indicates statistical significance, $p < .01$.

nonstandardized tests, the results generally indicate relatively low content acquisition scores, as evidenced in this study.

UNIT KNOWLEDGE TESTS

Description of Unit Tests

Unit Knowledge tests are short tests administered at the completion of each unit of instruction. Seven unit tests are discussed in this section, covering LAPs 2-1 and 2-2, and Units 3, 4, 6, 7, and 8. LAPs 2-1 and 2-2 were administered to both PDL and SPC students since both groups received this instruction. Units 3, 4, 6, 7, and 8 were administered only to the SPC students since only they received this instruction. The test on 5, Perceptual Skills, is not a knowledge test and is discussed in the following section.)

Item Analysis

Item total correlations appear in Table 8 for LAP 2-1 and LAP 2-2, and in Table 9 for Units 3, 4, 6, 7, and 8. The items have moderate correlations, though overall, each test has fairly high reliability for a 10-item test.[1] The reliability estimates range from .43 to .71. Items with correlations of less than .30 and/or extremely low correct response rates were inspected and appropriate revisions made. The revised tests appear in the appendices to the Instructor Guidance Packages, which are part of the *User Guidelines* (10). The response distribution of items by each unit is included in Tables 10 and 11. The means and standard deviation for each item are presented in Appendix I.

Comparison of PDL/SPC Curricula on LAPs 2-1 and 2-2

Since LAP 2-1 and LAP 2-2 Knowledge Tests were administered to both student groups, curriculum comparison can be made on these two unit tests. Table 12 shows the means in the factorial design. Differences between the PDL and SPC curricula appear nonexistent for these tests, but some variation, particularly by achievement level, can be noted. This is confirmed by the analysis of variance, Table 13. The most significant differences are between achievement levels, with students in the upper half of the class

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[1] The Unit 3 test contains 17 items. All other tests discussed in this section contain 10 items.

Table 8

Item Correlations With Total Scores for Unit Tests Administered to Both Student Groups

Unit	Correlations	
	PDL Group	SPC Group
LAP 2-1		
Item 1	.60	.50
Item 2	.46	.57
Item 3	.42	.52
Item 4	.59	.58
Item 5	.43	.46
Item 6	.45	.48
Item 7	.52	.38
Item 8	.51	.48
Item 9	.45	.49
Item 10	.13	.14
KR-20	.52	.50
LAP 2-2		
Item 1	.28	.39
Item 2	.53	.41
Item 3	.53	.40
Item 4	.46	.48
Item 5	.48	.46
Item 6	.45	.46
Item 7	.36	.56
Item 8	.41	.51
Item 9	.42	.37
Item 10	.36	.24
KR-20	.60	.71

having significantly higher scores than students in the lower half of the class. On LAP 2-1, males have significantly higher scores than females, but there is no significant difference by sex on LAP 2-2. There appears to be some interaction by curriculum. The most significant interaction on both LAP tests is curriculum by sex. As can be seen in Table 12, the major contribution to this interaction is higher performance by males than females in the PDL curriculum; there is little significant difference by sex in the SPC curriculum (males are actually slightly lower).

Unit Test Results for SPC Group

In general, SPC students, the only group administered these tests, performed best on the Unit 3 test (Normal Driving) and poorest on the Unit 8 test (Nonoperational Tasks). Each of the Unit Knowledge Tests for the SPC group was analyzed by achievement level and sex. The mean percent correct for each of the Unit Tests are provided in Table 14. Analyses of variance source tables are provided in Appendix B. The analysis of variance results indicated there were no significant differences by sex on any of the Unit Tests.

Table 9

Item Correlations With Total Scores for Unit Tests Administered Only to SPC Group

Unit	Correlation	Unit	Correlation
Unit 3		Unit 5	
Item 1	.08	Item 1	.45
Item 2	.48	Item 2	.49
Item 3	.33	Item 3	.41
Item 4	.35	Item 4	.42
Item 5	.23	Item 5	.43
Item 6	.42	Item 6	.52
Item 7	.38	Item 7	.32
Item 8	.40	Item 8	.29
Item 9	.40	Item 9	.12
Item 10	.33	Item 10	.44
Item 11	.10	KR-20	.43
Item 12	.33		
Item 13	.37	Unit 7	
Item 14	.46	Item 1	.36
Item 15	.27	Item 2	.32
Item 16	.37	Item 3	.37
Item 17	.42	Item 4	.47
KR-20	.53	Item 5	.47
		Item 6	.46
		Item 7	.39
		Item 8	.41
		Item 9	.31
		Item 10	.40
		KR-20	.46
Unit 4		Unit 8	
Item 1	.34	Item 1	.39
Item 2	.49	Item 2	.41
Item 3	.46	Item 3	.20
Item 4	.43	Item 4	.37
Item 5	.43	Item 5	.35
Item 6	.44	Item 6	.46
Item 7	.45	Item 7	.60
Item 8	.49	Item 8	.56
Item 9	.46	Item 9	.35
Item 10	.42	Item 10	.08
KR-20	.54	KR-20	.43

However, achievement level was significant for every Unit Test. As expected, upper level students had significantly higher scores. Only one significant interaction emerged from these analyses. On Unit Test 7, upper level males had higher scores than upper level females, but lower level females had higher scores than lower level males. The differences, however, are relatively small. It is difficult to provide an explanation for this result. It may be a chance occurrence, as several tests were made.

Table 10

Response Distribution of Items, by Units Studied by Both Student Groups

Unit	Group	Number of Items Correct			
		0-25%	26-50%	51-75%	76-100%
LAP 2-1—Control of the Car	PDL		2	6	2
	SPC		2	6	2
LAP 2-2—Simple Maneuvers	PDL		1	4	5
	SPC		2	5	3
Total		0	7	21	12

Table 11

Response Distribution of Items, by Units Studied by SPC Group

Unit	Number of Items Correct			
	0-25%	26-50%	51-75%	76-100%
3—Normal Driving	2	2	3	10
4—Environmental Factors		1	6	3
6—Driver Influences		3	4	3
7—Emergency Skills		1	7	2
8—Nonoperational Tasks	2	1	4	3
Total	4	8	24	21

PERCEPTUAL SKILLS TEST

Description of Perceptual Skills Test

The Perceptual Skills Test is a 10-item test in which students respond to driving situations presented in a 16mm film. It was administered as a pre-test and post-test for Unit 5, Complex Perceptual Skills, in the SPC. PDL students also received the pre-test and post-test in the same time frame, but did not receive Unit 5 instruction.

Item Analysis

Item correlations with total scores appear in Table 15. Although the number of items in the test is extremely small, most of the correlations are shown to be moderate. No single item has a consistently low correlation, although Items 8 and 10 appear to be the weakest.

Table 12

Mean Correct Responses on Unit Knowledge Tests, by Student Group, Achievement Level, and Sex

(Percent)

Unit/Achievement Level	PDL Group		Total	SPC Group		Total
	Male	Female		Male	Female	
LAP 2-1						
Upper	71.6	61.5	65.2	72.0	65.0	67.2
	(n = 58)	(n = 101)		(n = 47)	(n = 45)	
Lower	58.1	43.6	50.1	48.1	52.2	50.5
	(n = 37)	(n = 45)		(n = 42)	(n = 59)	
Total	66.3	56.0	60.0	60.7	60.1	60.3
LAP 2-2						
Upper	75.0	68.4	70.8	74.1	71.7	72.6
	(n = 58)	(n = 101)		(n = 44)	(n = 81)	
Lower	70.3	62.5	66.0	60.3	64.2	62.4
	(n = 37)	(n = 44)		(n = 38)	(n = 48)	
Total	73.2	66.6	69.2	67.7	68.9	68.4

Table 13

Analysis of Variance for Unit Knowledge Tests

Source	*df*	*MS*	F^a
LAP 2-1			
Curriculum	1	.41	<1
Level	1	309.95	82.24**
Sex	1	50.71	13.45**
Curriculum X Level	1	1.81	<1
Curriculum X Sex	1	31.80	8.44**
Level X Sex	1	2.92	<1
Curriculum X Level X Sex	1	16.26	4.31*
Error (Within Cell)	476	3.77	
LAP 2-2			
Curriculum	1	2.26	<1
Level	1	64.51	19.08**
Sex	1	10.32	3.05
Curriculum X Level	1	7.26	2.15
Curriculum X Sex	1	15.88	4.70*
Level X Sex	1	1.62	<1
Curriculum X Level X Sex	1	3.49	1.03
Error (Within Cell)	443	3.38	

[a] ** Indicates statistical significance, $p < .01$; *, $p < .05$.

Table 14

Mean Percent Correct on Unit Tests, by Achievement Level and Sex: SPC Group

Achievement Level	Male	Female	Total
Unit 3[a]			
Upper	78.0 (n=46)	75.0 (n=88)	76.0
Lower	67.6 (n=39)	67.3 (n=54)	67.4
Total	73.2	72.0	72.5
Unit 4[a]			
Upper	76.9 (n=45)	71.4 (n=85)	73.3
Lower	59.7 (n=38)	60.9 (n=53)	60.4
Total	69.0	67.4	68.0
Unit 6[a]			
Upper	65.7 (n=42)	68.5 (n=78)	67.5
Lower	55.1 (n=35)	61.3 (n=39)	58.4
Total	60.9	66.1	64.0
Unit 7[a]			
Upper	71.0 (n=41)	6.62 (n=78)	67.9
Lower	54.4 (n=32)	6.59 (n=39)	60.7
Total	63.7	66.1	65.2
Unit 8[a]			
Upper	65.5 (n=[illegible]0)	60.1 (n=76)	62.0
Lower	50.5 (n=34)	50.0 (n=38)	50.3
Total	58.7	56.7	57.5

[a] Differences by level were significant, $p < .01$.

Interitem reliability, using the KR-20 statistic, was as follows: PDL pre-test .10, and post-test .01; SPC pre-test .05, and post-test .02. These results demonstrate very low internal consistency, which is attributable to the extreme range of correlations, mixed direction, and heterogeneity of variance among the items. Comments by instructors indicated that administration of this test had a number of difficulties, particularly of a mechanical nature. This test was originally developed as a training device and was not

Table 15

Item Correlations With Total Scores for Perceptual Skills Test

Item	PDL Group		SPC Group	
	Pre-Test	Post-Test	Pre-Test	Post-Test
1	.38	.16	.44	.38
2	.37	.45	.39	.36
3	.30	.44	.41	.15
4	.21	.38	.35	.34
5	.31	.37	.30	.30
6	.36	.24	.20	.30
7	.31	.13	.31	.28
8	.15	.30	.16	.30
9	.46	.47	.33	.37
10	.18	.14	.05	.37

intended to be an intermediate criterion measure, *per se*. However, it was included as a testing device mainly to obtain preliminary data. Therefore, further analysis was conducted, in spite of the low interitem reliability. The correlation between pre-test and post-test scores for the PDL group, which received no instruction in the unit, was .30, indicating a moderately improved test-retest reliability.

Comparison of PDL/SPC Curricula

Mean correct responses for each item are presented in Table 16 and a summary of the percent of correct answers for each item appears in Table 17. These tables indicate

Table 16

Mean Scores (Number Correct) on Perceptual Skills Test, by Item

Item	PDL Group		SPC Group	
	Pre-Test (N=151)	Post-Test (N=176)	Pre-Test (N=196)	Post-Test (N=198)
Mean Item Score				
1	.70	.64	.59	.63
2	.79	.67	.58	.73
3	.83	.72	.66	.76
4	.52	.57	.52	.50
5	.84	.78	.83	.92
6	.81	.89	.90	.90
7	.51	.65	.55	.60
8	.37	.31	.38	.35
9	.59	.54	.50	.70
10	.94	.89	.90	.94
Mean Total Score	6.92	6.71	6.48	7.12

Table 17

Percentage of Correct Answers for Each Item, Perceptual Skills Test

Group	Item Numbers Correct			
	0-25%	26-50%	51-75%	76-100%
PDL				
Pre-Test		8	1, 4, 7, 9	2, 3, 5, 6, 10
Post-Test		8	1, 2, 3, 4, 9	5, 6, 7, 10
SPC				
Pre-Test		8, 9	1, 2, 3, 4, 7	5, 6, 10
Post-Test		4, 8	1, 2, 7, 9	3, 5, 6, 10

several things. Little, if any, difference is evident between curricula on pre-test and post-test, although the SPC group shows a moderate overall improvement on the post-test. The PDL group shows a slight decline, from pre-test to post-test. Items 5, 6, and 10 were answered correctly fairly consistently, and Item 8 proved to be the most difficult in nearly all cases, indicating a need for content re-evaluation.

Table 18 shows the total score means (in terms of percentage correct responses) in the factorial design. The differences in the two curricula seem to be applicable only to the post-test. Differences by achievement level and sex are often pronounced, although mixed in direction, and more noticeable on the pre-test. Since the pre-test results vary by achievement level and sex, analysis of covariance was used to control for these biases.

Table 18

Mean Percent Correct on Perceptual Skills Pre/Post-Tests, by Achievement Level and Sex

Test/Achievement Level	Mean Percent Correct					
	PDL Group			SPC Group		
	Female	Male	Total	Female	Male	Total
Pre-Test						
Lower	71.0 (n=20)	59.3 (n=15)	65.9	64.0 (n=38)	66.8 (n=31)	65.2
Upper	69.1 (n=58)	71.6 (n=38)	70.1	63.5 (n=73)	65.0 (n=42)	64.6
Total	69.62	68.02	69.0	64.2	65.8	64.8
Post-Test[a]						
Lower	66.5	64.0	65.4	71.6	70.3	71.0
Upper	66.6	72.4	68.9	71.4	71.9	71.6
Total	66.5	70.0	68.5	71.4	71.2	71.4

[a] Sample size for the analysis is the same as for the pre-test.

The source table for the analysis of variance (adjusted means) appears in Table 19. The difference in curricula, which, in this case, is training versus no *training*, is found to be significant at the .01 level. No other effects are significant.

Table 19

Analysis of Variance for Perceptual Skills Tests

Source	*df*	*MS*	*F*[a]
Curriculum	1	12.93	7.68**
Level	1	2.31	1.37
Sex	1	.60	<1
Curriculum X Level	1	.73	<1
Curriculum X Sex	1	1.87	1.11
Level X Sex	1	2.08	1.25
Curriculum X Level X Sex	1	.29	<1
Error (Within Cell)	306	1.68	

[a] **Indicates statistical significance, $p < .01$.

BASIC SKILLS RANGE TEST

Description of Basic Skills Range Test

The Basic Skills Range Test was administered to both the SPC and PDL student groups. The test includes the following subscales: Prestart/Start, Acceleration/Stopping, Maintaining Direction, Left Turn, Right Turn, Lane Change Left, and Lane Change Right. Each student is rated on performance during the 25-minute test.

Item Analysis

Table 20 gives the percent of students making the correct maneuver for each item within the seven subscales. For nearly all situations students in the SPC group scored higher than those in PDL. For example, in Lane Changes Left and Right, those in the SPC group cancelled turn signals far more frequently than those in the PDL group. Table 21 summarizes the percentage of correctly performed items. No single area seems to be particularly troublesome in either curriculum, and only three items appear to be difficult (maintaining lane while making a right turn, and "head check (90° angle)" in right and left lane changes).

Reliability estimates (KR-20) were computed for each group. For the SPC group, the reliability estimate was .66, and for the PDL group, .81. The difference in the estimates may in part be due to differences in scheduling. The test was administered to PDL students approximately 10 weeks after it was administered to SPC students. A strike in the Kansas City School System delayed PDL test administration for approximately 8 of the 10 weeks. During the strike, instructors received additional rater training, resulting in greater consistency of scoring.

Table 20

Percent Making Correct Maneuvers in Basic Skills Range Test

Subscale	Item Number	PDL Group (N=199)	SPC Group (N=226)
Prestart/Start	1	74.9	88.1
	2	98.0	99.6
	3	96.5	99.1
	4	94.0	98.7
	5	98.0	98.7
	6	90.5	90.3
Acceleration/Stopping	7	93.0	97.3
	8	87.4	92.0
	9	83.9	91.2
	10	98.5	96.0
	11	70.4	68.6
Maintaining Direction	12	95.0	97.8
	13	61.3	72.1
	14	94.0	97.3
Left Turn	15	84.9	84.1
	16	97.5	98.2
	17	94.0	93.8
	18	92.0	96.5
	19	69.3	83.6
	20	91.0	97.3
	21	94.5	98.2
Right Turn	22	85.4	87.2
	23	95.5	95.6
	24	89.9	90.3
	25	95.5	96.9
	26	38.7	67.3
	27	86.9	92.0
	28	93.0	96.5
Lane Change Left	29	60.8	70.8
	30	38.2	61.1
	31	74.4	91.2
	32	67.8	58.4
	33	74.4	89.4
Lane Change Right	34	61.3	75.7
	35	47.7	58.0
	36	78.9	92.9
	37	67.8	56.2
	38	75.4	94.7

Table 21

Item Numbers Correctly Performed in Basic Skills Range Test

Subscale	0-25%	26-50%	51-75%	76-100%
PDL				
Prestart/Start			1	2-6
Acceleration/Stopping			11	7-10
Maintaining Direction			13	12, 14
Left Turn			19	15-18, 20, 21
Right Turn		26		22-25, 27, 28
Lane Change Left		30	29, 31-33	
Lane Change Right		35	34, 37	36, 38
SPC				
Prestart/Start				1-6
Acceleration/Stopping			11	7-10
Maintaining Direction			13	12, 14
Left Turn				15-21
Right Turn			26	22-25, 27, 28
Lane Change Left			29, 30, 32	31, 33
Lane Change Right			35, 37	34, 36, 38

Comparison of PDL/SPC Curricula

Tables 22 and 23 show mean percentage correct for each section by curriculum, achievement level, and sex. Students receiving the highest scores were usually in the SPC group, upper achievement level, and male. Results from certain sections of the test differed to some extent, however. For example, the sections "Acceleration/Stopping" and "Lane Change Left" showed little, if any, differences between curricula.

The analysis of variance computed with total scores on the basic skills range test is shown in Table 24, verifying the general conclusions shown in Table 23. The main effects of curriculum, achievement level, and sex are all significant ($p < .01$). In addition, the

Table 22

Mean Percent Correct in the Basic Skills Range Test, by Achievement Level and Sex

	PDL[a]			SPC[a]		
Achievement Level	Male	Female	Total	Male	Female	Total
Upper	89.4 (n = 50)	80.3 (n = 82)	83.8	90.1 (n = 46)	86.9 (n = 88)	88.0
Lower	78.5 (n = 29)	77.7 (n = 38)	78.0	86.7 (n = 40)	85.3 (n = 52)	85.9
Total	85.3	79.5	81.8	88.5	86.3	87.2

[a] Sample size for the analysis shown here is the same for all maneuvers in Table 23.

Table 23

Mean Percent Correct for Each Subscale in The Basic Skills Range Test, by Achievement Level and Sex

	PDL Group		SPC Group	
Maneuver	Male	Female	Male	Female
Prestart/Start				
(Mean = 93.8)				
Upper	94.0	93.7	96.3	96.3
Lower	90.8	90.3	95.5	94.2
Acceleration/Stopping				
(Mean = 88.6)				
Upper	91.2	85.6	90.0	87.8
Lower	87.6	86.8	91.0	88.8
Maintaining Direction				
(Mean = 89.7)				
Upper	89.3	85.0	95.0	92.7
Lower	85.0	87.0	91.7	93.0
Left Turn				
(Mean = 92.0)				
Upper	94.6	88.0	96.9	91.9
Lower	91.1	89.1	92.1	92.6
Right Turn				
(Mean = 88.0)				
Upper	89.1	82.0	92.3	87.9
Lower	87.7	86.4	89.0	89.9
Lane Change Left				
(Mean = 78.6)				
Upper	79.2	74.2	76.6	78.0
Lower	84.8	82.2	78.0	76.6
Lane Change Right				
(Mean = 82.6)				
Upper	88.8	88.8	80.8	78.2
Lower	94.4	80.0	80.6	69.2

interactions of curriculum by level, and level by sex are also moderately significant ($p < .05$).

The analysis of variance results for each of the subscales of the Basic Skills Range Test are summarized in Table 25. (The complete source tables are in Appendix J.) These results show curriculum to be significant on five of the seven subscales. Level is significant on one of the subscales, and sex is significant on three. The only significant interaction effect is level by sex on the "Left Turn" subscale ($p < .05$). This interaction indicates that upper males perform better than lower males, but there is no difference in performance between upper and lower females.

Table 24

Analysis of Variance for the Basic Skills Range Test (Using Unweighted Means)

Source	*df*	*MS*	F^a
Curriculum	1	455.48	29.92**
Level	1	290.20	19.06**
Sex	1	175.59	11.54**
Curriculum X Level	1	61.26	4.02*
Curriculum X Sex	1	23.60	1.55
Level X Sex	1	85.33	5.60*
Curriculum X Level X Sex	1	35.42	2.32
Error (Within Cell)	417	15.22	

[a] ** Indicates statistical significance, $p < .01$; *, $< .05$.

Table 25

Summary of Analysis of Variance Results for Basic Skills Range Test Subscales

Source	Subscales						
	Prestart/ Start	Acceleration/ Stopping	Maintaining Direction	Left Turn	Right Turn	Lane Change Left	Lane Change Right
Curriculum (C)	$p < .01$	--	$p < .05$	$p < .05$	$p < .05$	--	$p < .01$
Level (L)	$p < .05$	--	--	--	--	--	--
Sex (S)	--	--	--	$p < .01$	$p < .05$	--	$p < .05$
Curriculum X Level	--	--	--	--	--	--	--
Curriculum X Sex	--	--	--	--	--	--	--
Level X Sex	--	--	--	$p < .05$	--	--	--
Curriculum X Level X Sex	--	--	--	--	--	--	--

EVASIVE RANGE TEST

Description of Evasive Range Test

The Evasive Range Test is administered after completion of Unit 7 classroom, simulator, and range instruction to all students in the SPC. In addition to its use in assessing basic control skills, the driving range is used to assess skill in dealing with emergency situations that do not occur frequently enough in normal driving and are too hazardous to stage on the public highway.

Maneuvers for the Evasive Range Test include:

(1) A serpentine course (Table 26).

(2) Evasive maneuvers; blocked lane (Table 27).

Table 26

Comparison of Number of Errors in Two Runs on Serpentine Course, Evasive Range Test, by Sex

	Mean Errors per 100 Trials				
	Male (N=57)		Female (N=97)		
Type of Error	1st Run	2nd Run	1st Run	2nd Run	Total
Leaves Exercise	10.2	8.5	13.4	11.3	11.2
Goes Straight	10.2	8.5	2.1	17.5	15.4
Brakes	1.7	3.4	7.2	6.2	5.1
Speed Under 25 mph	11.9	16.7	15.5	11.3	13.8
Hands Not at 9-3	6.8	10.2	10.3	11.3	9.9
Total Cones Displaced	144.1	86.4	125.8	128.9	122.8

Table 27

Comparison of Number of Errors in Two Runs of Blocked Lane Exercise, Evasive Range Test, by Sex

	Mean Errors per 100 Trials				
	Male (N=57)		Female (N=97)		
Type of Error	1st Run	2nd Run	1st Run	2nd Run	Total
Wrong Direction	10.2	8.5	13.4	11.3	11.2
Leaves Exercise	0.0	0.0	0.0	0.0	0.0
Goes Straight	0.0	0.0	0.0	0.0	0.0
Brakes	0.0	8.5	4.1	9.3	5.8
Speed Under 25 mph	1.7	1.7	2.1	4.1	2.6
Total Cones Displaced	174.6	137.3	222.7	194.9	188.7

(3) Controlled braking and steering (Table 28).

These tables show the test results for each of the three maneuvers.

Error Rate

Variations in error rate seen between the first and second runs tend to follow a pattern. Total number of cones displaced decreased consistently on the second trial, with the exception of the serpentine exercise for females. For other types (braking, keeping speed under 25 mph, etc.) the direction of errors did not follow a consistent pattern, although in several cases there was an increase in error rate on the second trial.

For the serpentine course, the errors most frequently committed, other than cones displaced, were "goes straight" and "keeping speed under 25 mph." An extremely large difference from first to second run on "goes straight" was found for females; the reason for this difference cannot be explained. For the blocked lane exercise, the most frequent

Table 28

Comparison of Number of Errors in Two Runs of Controlled Braking Exercise, Evasive Range Test, by Sex

Type of Error	Mean Errors per 100 Trials				
	Male (N=57)		Female (N=97)		Total
	1st Run	2nd Run	1st Run	2nd Run	
Leaves Exercise	1.7	0.0	0.0	1.0	0.6
Goes Straight	5.1	1.7	5.2	10.3	6.1
Locks Brakes	8.5	6.8	12.4	22.7	13.8
Speed Under 25 mph	1.7	6.8	7.2	4.1	5.1
Total Cones Displaced	166.1	154.2	258.8	214.4	207.7

other problem was "wrong direction." On the controlled braking exercise, the greatest problem, other than cone displacement, was "locked brakes."

In most cases, errors for males were significantly lower than for females.

Table 29 shows mean percent ratings (total scores) on the Evasive Range Test. The scores were derived by summing error categories for each exercise and converting to percentage correct. Consistent differences are evident by achievement level and by sex.

Table 29

Mean Total Scores[a] on Evasive Range Test, by Level of Achievement and Sex

(Percent)

Exercise/ Achievement Level	Male (n = 57)	Female (n = 97)
Serpentine		
Upper	60.6	47.5
Lower	47.5	45.5
Blocked Lane		
Upper	70.6	50.8
Lower	61.7	50.0
Controlled Braking		
Upper	65.2	41.9
Lower	62.9	46.6
Total		
Upper	64.2	51.1
Lower	57.4	47.4

[a] Higher score indicates better performance.

The differences were further examined by analysis of variance (Table 30). Differences between sexes are found significant for all but the serpentine maneuver. Achievement level is significant only on the blocked lane exercise. No interaction effects are significant.

Table 30

Analysis of Variance for Evasive Range Test

Source	*df*	*MS*	F^a
Serpentine			
Level	1	18.80	3.00
Sex	1	18.80	3.00
Sex X Level	1	10.22	1.63
Error (Within Cell)	150	6.28	
Blocked Lane			
Level	1	20.34	4.06*
Sex	1	53.75	10.72**
Sex X Level	1	0.39	<1
Error (Within Cell)	150	5.01	
Controlled Braking			
Level	1	1.90	<1
Sex	1	86.64	15.52**
Sex X Level	1	0.10	<1
Error (Within Cell)	150	5.58	
Total			
Level	1	84.31	3.32
Sex	1	397.07	15.66**
Sex X Level	1	7.20	<1
Error (Within Cell)	150	25.35	

[a] **Indicates statistical significance $p < .01$; *, $p < .05$

ON-ROAD PERFORMANCE TEST

The results of the On-Road Performance Test reported here include (a) inter-rater reliability checks, (b) pass rate by type of maneuver and element, and (c) total pass rate.

Inter-Rater Reliability Checks

Instructor training and inter-rater checks in the Spring semester were held during a seven-day workshop. Inter-rater reliability checks were made in order to achieve consistency on variable definitions and scoring procedures. The reliability checks among instructors were used mainly as an aid in refining definition of tasks and clarifying scoring procedures. Table 31 presents the results for both instructor rating instructor and instructor rating students. The ratings reflect the percentage of agreement on the total maneuver (Pass/Fail) as well as the seven variables (or elements) for the total maneuver. The procedure for obtaining the index was the same, with the exception of the individuals being rated (i.e., instructors or students).

Table 31

Results of Inter-Rater Reliability Checks for On-Road Performance Test

Reliability Check	Percent Agreement on Maneuver	Percent Agreement on Variables	Number of Pairs
Instructors Rating Instructors	92.4	87.6	18
Instructor Rating Students	84.4	83.3	38

A high degree of agreement on Pass/Fail checks for the maneuvers and elements was obtained among instructors rating instructors with a 92.4% agreement on maneuvers and 87.6% on the elements. Eighteen pairs of ratings were used to obtain the average agreement index.

In rating 38 students, a total of 1200 maneuvers were checked, and instructors agreed on 1017 maneuvers (84.4%). The number of elements for these maneuvers (e.g., path, position, speed) totaled 4910, with an agreement on 4109 (83.3%).

The inter-rater checks indicate a fairly high agreement index for instructor rating instructor and less so for instructor rating students. The differences are most likely attributable to more variation in student performance. Since student drivers committed more errors, the likelihood of disagreement on marginal cases would be increased.

Pass Rate by Maneuver and Element

Table 32 outlines the pass rate for the maneuvers. Some of the maneuvers have been combined for presentation purposes. For example, five left turns may have occurred throughout the test route. They are combined and presented here simply as "Left Turn." The table indicates the percentage of maneuvers passed, by sex and curriculum group (PDL versus SPC). The average maneuvers passed for all groups combined is 83.2%. The maneuvers (all groups combined) that fall below the average are indicated.

Of the 21 maneuvers presented, the SPC male students had a higher pass rate on 17 of the maneuvers than the PDL males. For SPC females, 19 of the maneuvers were higher than for the PDL females. Overall, males (85.5%) had higher pass rates than females (81.4%) and the SPC group (86.4%) had a higher rate than the PDL group (80.6%).

The below-average pass rate on the maneuvers indicated in Table 32 may suggest a need for more training in these areas. They appear to include, with the exception of Preoperative and Shut-Down, the more complex driving maneuvers.

Table 33 describes the elements summed across all maneuvers. The purpose of this analysis was to determine the general types of difficulties experienced by students. The marginal totals in Table 34 indicate the overall percent correct for each element. The correct responses for Path Position, Speed, and Observing range from 80-84%, while Signaling and Traffic Control are 90% and 94%, respectively. The latter two categories stand out as being the more obvious tasks that would be rated by the test administrator. For example, the student recognizes that failing to signal or stop at an intersection would result in an error. The remaining task elements are probably more a reflection of basic skill.

The SPC pass rates are consistently higher than PDL. Smaller differences occur on the two more obvious checks—Signaling and Traffic Control. As in the previous analysis

Table 32

Percent Maneuvers Passed[a] in On-Road Performance Test, by Sex

Maneuver	Males		Females	
	SPC Group (n = 73)	PDL Group (n = 64)	SPC Group (n = 102)	PDL Group (n = 94)
Preoperative[b]	85	70	78	77
Left Turn	88	89	87	82
Normal Transit	91	86	86	78
Curves[b]	76	78	76	72
Through Intersection[b]	85	83	85	83
Right Turn	92	88	86	82
Parked Cars	95	98	94	90
Uphill	91	84	83	82
Downhill	90	84	84	78
Pedestrians	83	77	86	93
Bridge	87	77	87	78
Merge[b]	76	66	67	48
Enter Traffic	88	80	92	84
Leave Traffic	97	89	92	87
Left Lane Change	89	80	85	74
Right Lane Change[b]	88	76	81	67
Being Passed	99	95	91	86
Off-Ramp	85	83	79	65
Passing Judgment[b]	--	87	82	73
Underpass	93	89	98	90
Shut-Down[b]	86	82	75	75
Average (Groups)	88.2	82.9	84.5	78.3
Average (Sex)	85.5		81.4	

[a] SPC males and females combined = 86.4; PDL males and females combined = 80.6.

[b] Maneuver which fell below the average.

on maneuvers, males tend to have higher pass rates than females. The major differences appear on Path, Position, Speed, and Observing.

Total Pass Rate

The percentage of maneuvers passed was used to evaluate the effectiveness of the programs on a statistical basis. A factorial design was used to evaluate the effects of curriculum (SPC versus PDL), sex, and schools (East, Northeast, Southeast). Achievement level was dropped for this analysis because of the small samples resulting in each cell.

The mean pass rate and sample for each factor are shown in Table 35. In this analysis, "schools" was used as a factor since the test routes varied. East High School and Northeast High School test routes were the same, with the exception of approximately two blocks. The Southeast High School route contained all of the same maneuver checks as East and Northeast, but was a completely different route.

Table 33

Percent Correct for Each Element Passed in On-Road Performance Test, by Sex

Elements	Males		Females		Total
	SPC (n = 73)	PDL (n = 64)	SPC (n = 102)	PDL (n = 94)	
Path	89	85	84	77	83
Position	86	86	82	78	83
Speed	84	82	82	72	80
Signaling	91	92	91	88	90
Observing	90	84	85	79	84
Traffic Control	95	94	94	92	94

Table 34

Overall Percent Correct for Each Element Passed in On-Road Performance Test

Element	SPC	PDL
Path	85	80
Position	84	82
Speed	83	76
Signaling	91	90
Observing	87	81
Traffic Control	94	93

The analysis of variance (Table 36) indicates that each of the factors—that is, curriculum, sex, and school—were significant and that there were no significant interactions. A study of the mean errors reveals the direction of the significant main effects: The SPC students performed significantly better than the PDL (87% versus 78%), males performed better than females (85% versus 80%), and there was a significant difference among the schools. The difference between East and Northeast was not significant, but both had a significantly higher pass rate than Southeast.

The differences in pass rate by curriculum are most likely attributable to the amount of training. The SPC students were given seven hours of on-street lessons, while the PDL students received only two. The difference by sex may also be a reflection of more outside driving experience reported by males as compared to females. It cannot be stated whether the differences by school are due to student background or the test route.

Table 35

Mean Pass Rate in On-Road Performance Test, by Sex[a] and School

School	SPC Group		PDL Group		Total
	Males	Females	Males	Females	
East	86.7 (n = 24)	89.3 (n = 29)	82.7 (n = 27)	75.2 (n = 24)	83.5 (n = 104)
Northeast	91.6 (n = 26)	89.2 (n = 18)	84.2 (n = 21)	77.9 (n = 24)	85.8 (n = 89)
Southeast	84.6 (n = 23)	80.1 (n = 55)	81.0 (n = 16)	70.8 (n = 46)	79.0 (n = 140)
Average (Groups)	87.0		78.6		

[a] Males combined = 85.2; females combined = 80.4.

Table 36

Analysis of Variance for On-Road Performance Test

Source	df	MS	F[a]
Curriculum	1	5129.1	20.17**
Sex	1	1655.9	6.51*
School	2	1115.6	4.39*
Curriculum X Sex	1	808.2	3.18
Curriculum X School	2	64.5	<1
Sex X School	2	153.7	<1
Curriculum X Sex X School	2	60.8	<1
Error (Within Cell)	321	254.3	

[a] **Indicates statistical significance $p < .01$; *, $p < .05$.

ATTITUDE MEASURE

Description of Attitude Measure

The Pseudo-Knowledge (Attitude) Test and selected Mann Inventory (11) items were administered as knowledge pre-tests and post-tests in both curricula.

There were no "right" or "wrong" answers for this Pseudo-Knowledge Test, since its purpose was to determine safety "attitudes" among the students. As mentioned in Chapter 4, very little can be said at this time about the "utility" of this measure. Items need to be validated, and further development is needed. However, distribution of responses is useful in detecting shifts of attitude between "pre" and "post" as well as differences between curricula.

The percentage distributions of responses to each question and percentage differences between pre-test and post-test (post minus pre) appear as Appendix G-2.

Results of Attitude Measure

In general, differences between PDL and SPC groups, detectable on the pre-test, become more pronounced on the post-test. Certain items, such as 2, 7, 9-13, show large differences by curriculum on the pre-test. In each case, the SPC group more frequently selected the more realistic and less overcautious response. As an example, the response rate to Item 7 is presented here:

Driving in bad weather:

a. Requires extra caution
b. Tends to be hazardous.
c. Should always be avoided if possible.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	67.7	64.7	-3.0	78.9	73.9	-5.0
b.	4.5	4.1	-0.4	10.6	10.6	0.0
c.	27.9	31.2	3.3	10.6	14.4	3.8

In this case, answer a) would seem the most realistic alternative. Answer b) demonstrates a lesser concern for safety, and answer c) would seem unrealistically overcautious. The relatively high PDL response rate to answer c) on the pre-test compared to that of the SPC group demonstrates the PDL group's generally more overcautious attitude.

For the Mann Inventory items (Items 21-48) group pre-test differences were generally less pronounced, although SPC students tended to project a more positive, less critical attitude. The pre-test differences between SPC and PDL could be explained by (a) variation in the amount of course content,[1] that is, SPC content was more extensive; or by (b) the perception of the PDL group as being in a less comprehensive program than the SPC group.

Test results in both curricula show a number of significant changes from pre-test to post-test. The largest shifts in the PDL were in Items 2, 6, 11, 17, 19, 23, and 25; in the SPC, Items 2, 3, 9, 14, 23, 39, and 47. Again, almost all changes were in the direction of a more realistic, less overcautious driving attitude.

An example of a more realistic driving attitude is provided by the responses to Item 23 (for this section of the test, response a) = Always; b) = Usually; c) = Sometimes; d) = Rarely; e) = Never):

I ______ feel full of pep when I get behind the wheel.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a)	30.3	18.2	-12.1	36.1	25.5	-10.6
b)	32.3	31.8	-0.5	31.1	37.2	6.1
c)	23.4	30.6	7.2	18.3	21.8	3.5
d)	6.5	10.0	3.5	7.8	8.5	0.7
e)	6.5	9.4	2.9	6.7	6.9	0.2

---

[1] The pre-test was administered to both SPC and PDL groups prior to Unit 6 instruction in the Safe Performance Curriculum. Therefore, SPC students had received five units of instruction prior to the pre-test, as compared to PDL students who had received only two and one-half units of instruction.

There is a significant decline in the number of students in both programs who make the unrealistic assessment that they "ALWAYS feel full of pep" when driving.

There are a few exceptions to this trend toward more realistic and less overcautious responses. Items 5 and 12 for both curricula and Item 13 for SPC showed increases in response rate to the excessively cautious response on the post-test. This may be a result of heavy classroom emphasis on the areas of content reflected in these items. (Students were under the impression this test would be graded.)

The SPC students, particularly, seemed to increase in response frequency to choices that could be considered realistically safer (e.g., Items 3, 4, 8, 31, 39). There also seems to be a trend on the post-test for students to be less critical of themselves and other drivers (e.g., Items 6, 8, 18, and 27).

There are several possible explanations for these results. Continued exposure to driving and driver problems should cause driving attitudes to become more realistic. Unsafe attitudes should be pointed out, while excessively cautious attitudes should be proven infeasible. In this respect, the post-test results are as expected. However, a major question is the problem of test-taking attitude. This trend toward more realistic responses may indicate only greater candor on the part of students and less emphasis on the response they felt the instructor would consider correct. This effect could have been caused by a number of factors, such as the time between tests or the number of intervening knowledge tests. A similar explanation can be given for the pre-test differences between SPC and PDL, since attitude pre-tests were not given immediately at the beginning of the courses. The more frequent positive responses on the Mann Inventory items by the SPC group could also be explained by the fact that PDL students knew they were in a less comprehensive program and may have tended toward more negative responses.

Pseudo-Knowledge Test

The results of a subexperiment conducted in conjunction with the Attitude Measure are shown in Table 37. The purpose of the experiment was to determine whether students were able to identify the test as an "attitude" test. After administration of the Attitude Measure and a knowledge test, a list of six questions was administered to a small subset of students who had received no training. The direct assessment of the purpose of the test is indicated on Item E, alternatives 1 and 4, which shows a tendency for students to rate the purpose of the knowledge test higher than the Pseudo Knowledge Test when referring to "knowledge" (64% vs. 55%). However on alternative 4, "Driving attitude," there is little difference (15% vs. 13%).

The remaining items were developed in an attempt to indirectly tap students' reactions to the tests, where attitude items might be expected to be more unclear and ambiguous. The results did not support this expectation. In fact, students tended to indicate that the Pseudo-Knowledge Test was more clear and provided more correct answers than the knowledge tests.

In summary, the students were not able to detect marked differences between the Pseudo-Knowledge Test and the knowledge test. Therefore, the attempt to disguise the purpose of the test by using a knowledge test format was apparently successful.

INTERRELATIONSHIP AMONG INTERMEDIATE CRITERION MEASURES

Correlational analyses were performed on total scores for the intermediate criterion measures. The analyses were run separately, by PDL and SPC, to determine whether interaction or differences in relationships occurred within each program. Since all measures were not common to both programs, the matrices were run separately.

Table 37

Subjective Reactions to Pseudo-Knowledge and Knowledge Tests

	Tests *(Percent)*	
	Pseudo-Knowledge *(Attitude)*	Knowledge
Item A. *Did you understand the questions asked?*	(n = 29)	(n = 37)
1. I understood most of the questions.	79	76
2. I understood some of the questions.	17	24
3. I didn't understand any of the questions.	4	--
Item B. *Did you think that the choices given for each question were clear and easy to understand?*	(n = 29)	(n = 37)
1. Very clear.	45	30
2. Somewhat clear.	52	70
3. Not clear at all.	3	--
Item C. *Did you think there were any questions which didn't give the right answer?*	(n = 29)	(n = 36)
1. Most didn't.	3	11
2. About half didn't.	21	8
3. All of the questions had a right answer.	76	81
Item D. *How hard were these items to answer?*	(n = 29)	(n = 37)
1. Very hard.	3	--
2. Somewhat hard.	45	59
3. Not hard at all.	52	41
Item E. *What do you think the purpose of this test was? (Check one) To test:*	(n = 40)	(n = 39)
1. Driving knowledge.	55	64
2. Driving skills.	13	10
3. Driving performance.	7	3
4. Driving attitudes.	15	13
5. Operational procedures	10	10
Item F. *Check those items that describe how you felt about the test* (You can check more than one):	(n = 48)	(n = 51)
1. Pleased.	25	37
2. Disgusted.	12	4
3. Bored.	25	15
4. Confused.	15	22
5. Confident.	17	20
6. Angry.	6	2

Results of Correlational Analysis

The results of the correlational analysis provide some insight as to the content validity. (For example, unit and general knowledge tests would be expected to have relatively high correlations.) Also, the matrices provide correlations of general interest, such as the relationship between performance and knowledge.

The correlation matrix of total scores for the PDL group is presented in Table 38. One general trend can be observed where the Knowledge Pre/Post Tests correlate moderately with the two LAP Knowledge Tests and fairly high with each other (.58). The relationship between pre-test and post-test is also a rough indication of test-retest reliability since much of the course content (items) was not presented to the PDL group. This estimate is probably an upper-bound estimate of test-retest reliability, since some instruction was provided which could influence the correlation.

Table 38

Matrix of Simple Correlations Among PDL Test Scores[a]

	Knowledge Pre-Test	LAP 2-1	LAP 2-2	PS Pre-Test	PS Post-Test	Knowledge Post-Test	Basic Skills Range Test
Knowledge Pre-Test	--						
LAP 2-1	.40	--					
LAP 2-2	.38	.43	--				
Perceptual Skills Pre-Test	.11	.12	.06	--			
Perceptual Skills Post-Test	.06	.19	.11	.30	--		
Knowledge Post-Test	.58	.53	.50	.22	.20	--	
Basic Skills Range Test	.36	.28	.23	.18	.04	.36	--

[a] Correlations .14 are significant at $p \leq .05$.

The Perceptual Skills Test has low correlations with the other measures and a moderately low pre/post test correlation (.30). Since the PDL group did not receive training in perceptual skills, the pre/post test correlation is again a measure of test-retest reliability.

The correlation matrix of total test scores for the SPC curriculum is presented in Table 39. Again, the Perceptual Skills Pre/Post-Tests correlate very poorly with the other tests in the curriculum and moderately with each other (.20).

The Knowledge Pre/Post-Test correlation is .55 and both pre-test and post-test correlate moderately highly with the Unit Knowledge Tests. The Evasive Range Test has its highest correlation with Knowledge Pre-Test (.26) and lowest with Perceptual Skills Post-Test (.01). The correlation between the Evasive Range Test and Basic Skills Range Test, both performance measures, is lower than expected, with a value of .26.

The magnitude of the correlations, when comparing PDL and SPC, is quite similar. For example, the correlations between Knowledge Pre/Post-Tests for PDL and SPC, respectively, are .58 and .55. The correlations for the Knowledge Post-Test and LAP 2-1 for PDL and SPC, respectively, are .53 and .52, and for LAP 2-2, .50 and .43. The correlation of the Perceptual Skills Test with other tests is low for both groups.

Table 39

Matrix of Simple Correlations Among SPC Test Scores[a]

	Knowledge Pre-Test	Unit 3	Unit 4	Unit 6	Unit 7	Unit 8	LAP 2-1	LAP 2-2	PS Pre-Test	PS Post-Test	Evasive Range Test	Knowledge Post-Test	Basic Skills Range Test
Knowledge Pre-Test	--												
Unit 3	.43	--											
Unit 4	.40	.36	--										
Unit 6	.28	.19	.31	--									
Unit 7	.40	.39	.38	.26	--								
Unit 8	.29	.26	.31	.34	.34	--							
LAP 2-1	.51	.42	.48	.32	.30	.37	--						
LAP 2-2	.38	.40	.45	.27	.32	.34	.42	--					
Perceptual Skills Pre-Test	.09	.11	.07	.01	.10	.12	.18	.15	--				
Perceptual Skills Post-Test	.07	.04	.06	.14	.08	.03	.12	.01	.20	--			
Evasive Range Test	.26	.18	.20	.01	.09	.07	.23	.10	.07	.01	--		
Knowledge Post-Test	.55	.50	.53	.46	.43	.41	.52	.43	.02	.09	.21	--	
Basic Skills Range Test	.19	.24	.25	.08	.02	.11	.22	.23	.04	.04	.27	.18	--

[a] Correlations $\geq .14$ are significant at $p \leq .05$.

SUMMARY AND RECOMMENDATIONS FOR INTERMEDIATE CRITERION MEASURES

The content acquisition scores for PDL and SPC and the Unit Knowledge Evasive Range Test scores for SPC are illustrated in Figure 10. Major findings of the pilot test are discussed below.

Intermediate Criterion Measures

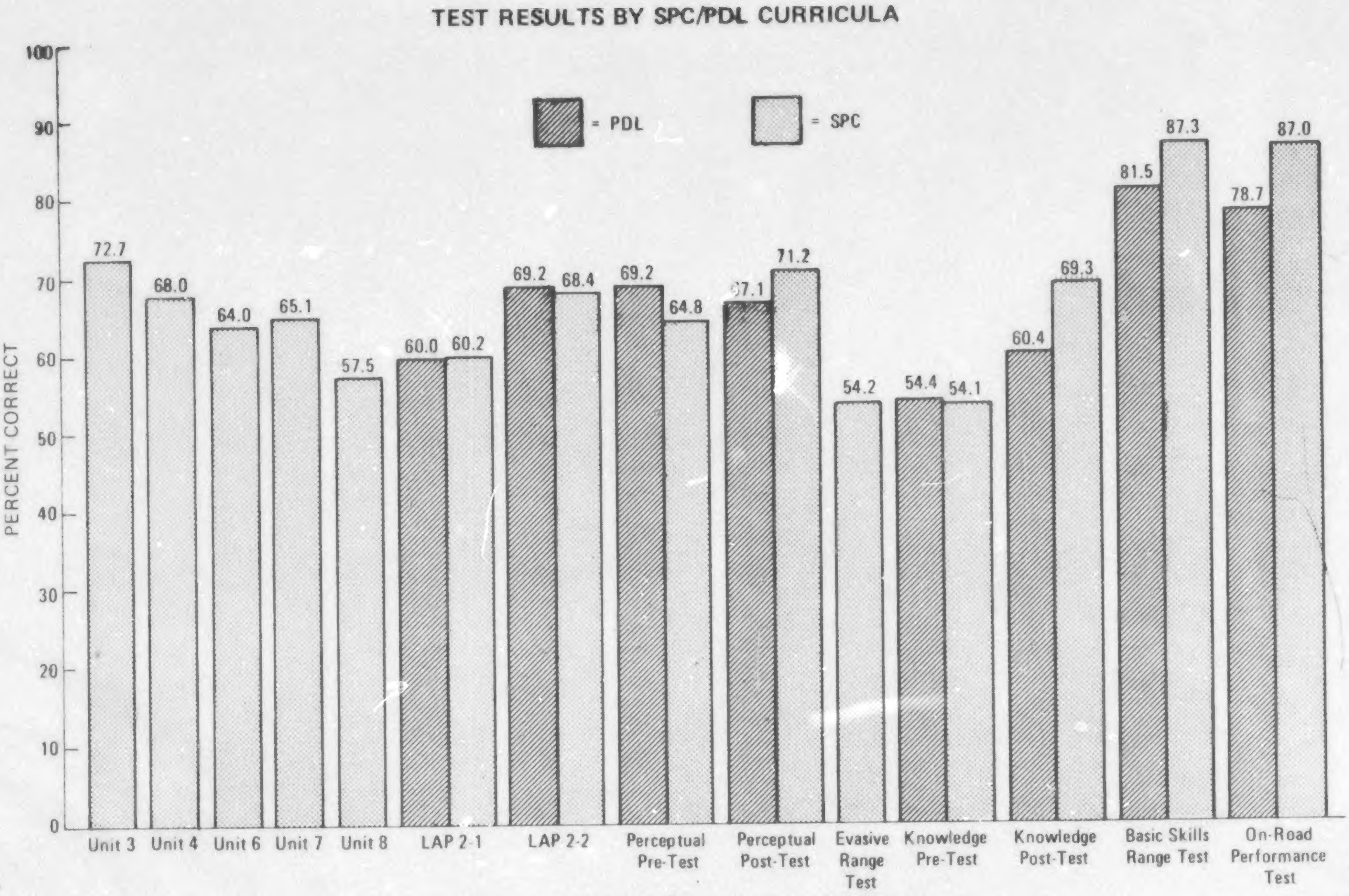
Overall, SPC students had significantly higher scores on knowledge, skill, and performance tests than PDL students. However, it is important to note that:

1. (1) The content acquisition scores (% pass) on the Driving Knowledge Post-Test were relatively low. Scores ranged from 69% downward to 60%.
2. (2) On all of the Unit Knowledge Tests, the SPC pass rate ranged from 57% to 73%, which may indicate that not all of the instructional objectives of the program were attained.
3. (3) On the Evasive Range Test, the SPC pass rate was low (54%). On the Basic Skills Range Test, the pass rate was much higher (SPC 87% and PDL 81%).
4. (4) The largest differences between SPC and PDL were on the On-Road Performance Test, and Knowledge Post-Test. The SPC pass rate for the ORPT was 87%, and the PDL pass rate was 79%. SPC pass rate for the Knowledge Post-Test was 89%, and the PDL pass rate was 83%.
5. (5) On the Perceptual Skills Test, the differences between SPC and PDL, although significant, were relatively small (SPC 71% and PDL 67%).

Status of Intermediate Criterion Measures

In Table 40, reliability estimates for each test are summarized and recommendations and statements are provided on the degree of test refinement. Primary recommendations are as follows:

1. (1) With all the tests administered, the primary question is the ultimate validity of the test—that is, do any of the measures relate to real-world driving performance? This question would require long-term, follow-up procedures.
2. (2) Since tests are not standardized, it is difficult to assess the relative difficulty level of an individual test. However, it is thought that the overall low content acquisition scores are attributable to an over-emphasis on independent study, rather than to the difficulty level of the tests. The Knowledge Test items, based upon the objectives of the curriculum, were of high criticality, and were emphasized in the course content. (See Student Feedback in Chapter 6.) Inadequate presentation of course content by instructors may also have contributed to the low content acquisition scores. Support for this position is found in Consultant Feedback (Chapter 6). Test standardization and increased reliability are needed to assess more adequately the relative difficulty level of the tests.
3. (3) The intermediate criterion measures were useful for measuring program effects for content/skill acquisition. However, several recommendations can be made for improvement of some of the measures:
   - Format and test administration procedures could be improved in the On-Road Performance Test.
   - Scoring and rating procedures on the performance tests could be refined through additional pilot testing to improve inter-rater reliability and internal consistency.



PERCENT MEAN CORRECT RESPONSE BY PROGRAM

Figure 10

Table 40

Status of Intermediate Criterion Tests

	Sample Size			
Measure	PDL	SPC	Reliability^a	Recommendations/ State of Refinement
Driver Performance Tests				
On-Road Performance (35 maneuvers)	158	175	.84 (Inter-rater)	• Revise format to make scorable items more maneuver-specific. • Refine definition of errors. • Requires extensive instructor training.
Basic Skills Range (38 items)	199	226	.66 - .83	• Obtain inter-rater reliability checks. • Refine definitions of errors. • Requires extensive instructor training.
Evasive Range (30 items)		154	Not Available	• Obtain inter-rater reliability checks. • Requires extensive instructor training.
Driver Knowledge/Skills Test				
Knowledge Test				
Pre-Test (25 items)	250	251	.45 - .65	• Reliability low; requires more items.
Post-Test (50 items)	177	191	.86	• Current test adequate. • Possibly add more items for more comprehensive coverage.
Perceptual Skill Tests (10 items)				
Pre-Test	151	196		• Requires complete revision and/or substitution of different test.
Post-Test	176	198	.01 - .10	• Method of test administration/materials poor.
Unit Knowledge Tests (10 items each)				
LAP 2-1	241	243	.52 - .50	• Adequate test. • Fairly high reliability for small number of items.

(Continued)

Table 40 *(Continued)*

Status of Intermediate Criterion Tests

Measure	Sample Size		Reliability^a	Recommendations/ State of Refinement
	PDL	SPC		
LAP 2-2	240	211	.60 - .71	• Same as LAP 2-1.
Unit 3		227	53	• Same as LAP 2-1.
Unit 4		221	.54	• Same as LAP 2-1.
Unit 6		194	43	• Same as LAP 2-1.
Unit 7		190	46	• Same as LAP 2-1.
Unit 8		188	.43	• Same as LAP 2-1.
Attitude Measure			Not Available	• State of refinement low. • Requires validation (construct and predictive). • Further content analysis.

^{a}Reliability estimates are internal consistency (KR-20) unless otherwise specified.

- Perceptual Skills Test requires major revision or substitution.
- Major work is needed on the Attitude Measure. It requires validation to determine which attitudes are related to safe driving practices.

It is concluded that the Knowledge and Unit Tests are at a sufficient stage of refinement for use in a research or operational program. However, continued efforts should be made to improve the tests by conducting reliability checks and making appropriate revisions. Additional effort is required to bring performance measures to an adequate level. In-car instruction is more costly than classroom instruction. Therefore, more effective and efficient training and testing techniques should be developed for this instructional mode. The difficulty in developing highly reliable tests lies in the subjective judgment required of instructors. Although other observational methods are available (e.g., video tape or automated sensing devices), they are expensive. The instructor(s) will most likely continue to be the major source of data. The development of highly reliable data depends on an adequate, uncomplicated testing format and a clear understanding by instructors of the definitions of performance on the test. (The latter requires a considerable amount of instructor training.) Regardless of the refinement of the "paper" procedures and instructions, high reliability estimates are dependent upon experience and interaction of the instructors to develop common behavioral observations.

Short Term Research Recommendations

It is recommended that additional information be obtained from students involved in the pilot study. The information should be very useful in future program planning for implementation of the curriculum on a larger scale. Samples from student groups in both the Fall 1973 and Spring 1974 semesters should be contacted to obtain information on their driving status, current driving experiences and relationship to course exposure, and recall of course material. Samples of items in these three areas are outlined below:

(1) Driving Status
  - Number who received licenses.
  - Number of attempts to obtain licenses.
  - Months before license obtained.
  - Additional outside instruction.
  - Driving record (accidents/violations), use of car, and driving exposure.

(2) Driving Behavior and Relationship to Course Exposure
  - Use of car and driving exposure.
  - Adequacy of PDL/SPC curricula in meeting real-world driving requirements.
  - Trip behavior.
  - Problems experienced, need for training, and near misses.

(3) Recall of Course Material
  - Administer knowledge test to determine recall of course material.
  - Provide additional information on test reliability (i.e., temporal stability).

It is suggested that questionnaires be administered to all students attending the Fall and Spring semesters (approximately 1,000 students). Items from Driving Status (A) and Driving Behavior (B) would be included in the questionnaire. In addition to the information obtained in these areas, data on mobility and dropout rate would be provided. This data would be useful in planning implementation projects oriented toward obtaining long-term, follow-up data, as attrition rate would be a factor in determining sample size requirements.

Two approaches are proposed for administering the questionnaire:

(1) Group administration in a school setting. This approach should allow for a complete response rate for those students who continue school (junior year) and who are available at test administration time.

(2) A mail-out to dropouts and a subsample of students continuing school. The mail-out approach is recommended since it may "simulate" the logistics and procedures that may, by necessity, be used in obtaining long term, follow-up data.

For Recall of Course Material (C), it is proposed that a subsample of continuing students in both PDL and SPC be administered the Knowledge Post-Test in a group setting. The test administration could be combined with the questionnaire administration suggested above. The test should not be mailed, because mailing it might destroy the "integrity" of the instrument.

Several variations of the proposed research could be conducted. For example, subsamples of students could be retested on performance measures. These decisions, of course, are predicated on resources available for conducting the research.

Chapter 6

CONSULTANT, INSTRUCTOR, AND STUDENT FEEDBACK

This chapter includes a detailed identification of problems and major recommendations for corrective action, as determined from the evaluations of the consultants, instructors, and students.

SUMMARY OF EVALUATIONS AND RECOMMENDATIONS

Consultants' Summary

Comments from consultants indicated that instructors needed more training in the basics of driver education methods/techniques/content, and in general instructional methods and techniques (not necessarily driver education-related) for dealing with students.

The original project proposal called for recruiting and employing experienced driver educators as instructors.[1] However, the following problems were anticipated with this approach:

(1) It would have been difficult to find highly-qualified driver educators who would have been willing to relinquish their positions for a short-range project.
(2) High salaries would have been needed to attract qualified candidates and to compensate them for relocation.
(3) Preparation of instructors for the administration of the two curricula would have had to take place during limited periods of availability such as Easter vacation and the short period between the end of the Spring semester and the beginning of the Summer 1973 pilot test.

Because of these difficulties, an alternative plan was adopted.

Instructor candidates were selected by the staff of the School of Public Service of the Central Missouri State University (CMSU), Warrensburg, Missouri (the subcontractor for the program) from recent CMSU graduates. The advantages to this approach were considered to be these:

(1) Most of the candidates already resided in the Kansas City area, and relocation would not be a serious problem.
(2) The close relationship between the CMSU Safety Center staff and the candidates would permit selection of the most qualified instructors.
(3) Since the instructors selected would not have teaching patterns of long standing, they should have little resistance to teaching under the safety-oriented and operations-oriented curricula.

A disadvantage with this approach was the lack of actual teaching experience on the part of the instructors selected for the program. It was hoped that this problem could be alleviated through intensive training programs prior to and during the administration of the pilot test. However, since the training programs were geared generally toward familiarizing the instructors with the Safe Performance Curriculum and the basic research design for this study, they proved ineffective in compensating for a general lack of knowledge in the area of driver education content and lack of experience in teaching driver education.

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[1] Complete staffing requirements for the program are described in Appendix K.

It is now apparent that the curriculum requires instructors with an extensive background in teaching driver education, particularly in the areas of range and on-street instruction. Instructors must also be able to conduct multimedia and simulator sessions, have the ability to "individualize" instruction (i.e., to monitor the progress of each student through all of the instructional modes), and to ensure that the learning needs of each student are matched with the appropriate educational resource.

Recommendations. Although all pilot test instructors had what appeared to be adequate formal university training, their performance did not bear this out.

It is recommended that an intensive training session for pilot test instructors be held prior to actual pilot test implementation, using a small group of students (about 30). This would allow the instructors to become familiar with the curriculum *per se*, without concern for other pilot test requirements (e.g., coordination and scheduling, data collection, and recordkeeping for large numbers of students).

An alternative to an intensive training session would be to obtain driver educators with extensive teaching experience, especially in the areas of range and in-car instruction. In the Kansas City pilot test, most of the instructors had less than one year of actual teaching experience.

Regardless of the approach taken, materials must be provided to instructors weeks before implementation, and some form of instructor orientation session must be held prior to implementation.

Instructors' Summary

Most instructors indicated that the instructional materials available in Spring, 1974 were greatly improved over previous semesters.[1]

Although the curriculum specifications for films and slides are comprehensively covered in the materials currently available, the instructors indicated a need for improvement in the quality of some. Recommendations for improvement of media have been provided to the sponsoring agency, National Highway Traffic Safety Administration.

To maintain student interest in classroom instruction and outside reading requirements, it appears that instructors should utilize motivation approaches more effectively. Instructors indicated that students became bored near the end of classroom instructions and did not read outside assignments.

Students' Summary

Student comments are comparable to the instructor comments. They indicated that some of the classroom instruction was boring, and they didn't always read outside assignments. A large percentage indicated a desire to do more driving and less course work.

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[1] Instructor recommendations for futher modification and revisions are included in the Instructor Guidance Packages, which are part of the *User Guidelines*, final report (10).

SUBJECTIVE REACTION: CONSULTANT FEEDBACK

Feedback from project consultants[1] on instructor performance is categorized according to three of the six modes of instruction employed in the curriculum: classroom (including simulator), range, and on-street. Recommendations for instructor improvement in each mode are presented.

Summary

Consultants' comments indicated a need for two kinds of training for instructors in the pilot test: additional training in teaching methods specific to driver education, and training in methods for effective teaching, regardless of the subject matter. The need for pilot test instructors to have more training in general educational methods and techniques for dealing with students was demonstrated by the repetition of such comments as: "Student problems need both diagnosis and prescription"; "Students need to be told what is expected of them in each lesson"; "Students need feedback on their performance, but given at the appropriate moment"; "Instructors must convey course content as prescribed"; and "Student involvement must be maintained."

Consultants commented also on more specific instructor inadequacies. Further training in effective instructional methods would obviate the need for such criticisms as: "Get students to speak louder"; "Use previously learned technical terms"; "Try to give very specific instructions"; "Make sure you know how to operate projector"; and "Teachers should position themselves properly in the simulation lab."

Consultants' comments indicated strongly that instructors needed more training and experience particularly in the application of driver education techniques. Evaluations of instructors' on-street performance stressed this weakness. Instructors were advised: "Give directions a bit sooner"; "Watch student hand position. . . . make sure hand-over-hand steering technique is used"; "Try not to use street names until end of lesson"; "Watch for rolling stops"; and "Several students did not know how to position mirrors. . . . This should be demonstrated to each student on range."

There were many more comments like these, emphasizing that even by the third implementation of the program, some of the "basics" of driver education were not yet "second nature" to instructors. Experience, it would appear, would have precluded much of the consultant criticism of the instructors.

Consultant recommendations, by instructional mode, follow. Recommendations made by more than one consultant are marked by an asterisk.

Recommendations for Classroom

- Instructors should try to use terminology already learned by the students.
- Instructors should not go through classroom material too quickly. They need to make sure that students know content that is essential to up-coming on-street lessons.*
- Instructors should identify student problems in class, not just in the car. It is important to correct student errors in class and to clarify answers that aren't entirely correct.*
- Instructors need to involve the entire class, not just part of it.
- Instructors need to be more proficient in using teaching aids and equipment.*

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[1] Driver education specialists were assigned to the project during the Spring, 1974 semester to provide training for the project instructors and to evaluate their performance.

- Instructors should provide students with a strong orientation toward guided learning in class. Objectives should be made clear and a variety of motivating materials provided.
- Instructors must make sure to use prescribed teaching/learning methods.
- Instructors must make sure to convey course content as prescribed.

Simulation

- Instructors should use techniques and terminology in the simulation lab that can also be used in on-street lessons.*
- Instructors should reinforce previously learned terminology.
- Instructors must take an active part in simulation lessons by observing and correcting student performance. Proper learning habits must be reinforced.*
- Instructors must know how to operate simulation equipment before the lesson. Equipment and films should be in working order.*
- Instructors must be thoroughly familiar with simulation films before the lesson. They must know sequence of segments so that the films aren't interrupted with irrelevant narration.*
- Instructors must prepare their own narration so that they are not simply parroting the films.
- Instructors should avoid stopping films unnecessarily, since interruptions detract from the realism of simulation.

Recommendations for Range

- Instructors should use the time spent traveling to and from the range to clarify lesson objectives with students and to provide students with feedback on their performance.
- Instructors should make sure they understand the objectives of the range lessons.
- Instructors should follow lesson specifications according to their intent, rather than following specifications to the letter when inappropriate.
- Instructors should make sure that the backseat observers are involved in the range activity. The observer checklists should be explained and employed.

Recommendations for On-Street

- Instructors should make sure that when they tell a student he or she has made a mistake they also tell the student how to correct the mistake.
- Instructors must time feedback to students so as not to interfere with the next maneuver.*
- Instructors should encourage "positive" as opposed to "aggressive" driving habits. Drivers should be taught to move without hesitation once they have determined it is safe to execute the maneuver.
- Instructors should prepare student for on-street lesson with an outline of what to expect and what is expected of him.
- Instructors should involve backseat observers by encouraging them to participate mentally in the driving task, for example, count seconds to estimate acceptable gaps.*
- Instructors should bring all close calls and near-misses to the student's attention immediately. (Some students were totally unaware of what had taken place.)
- Instructors should provide a critique immediately after the on-street lesson, consisting of (at a minimum) diagnosis and prescription for all individual performances.

- Communication should not always be from instructor to student. Instructors should encourage feedback from students, particularly from the better performers, on their observations. This will increase involvement of both drivers and observers.*
- Instructors should use an effective balance between giving directions and allowing student trials, that is, they should avoid over-teaching.
- Instructors should use unplanned situations to facilitate learning of important concepts.
- Instructors should avoid using technical terminology that the student has not yet been exposed to.

SUBJECTIVE REACTION: INSTRUCTOR FEEDBACK

Detailed feedback was obtained from instructors for each classroom, simulator, range, and on-street lesson in the Safe Performance Curriculum. Their feedback, by instructional mode, is summarized below.

Recommendations for Classroom

Classroom sessions were generally described as effective. Group commentary technique in the classroom was generally rated well among the instructors who tried it. However, some did not use it at all. Student interest was high initially, but by the fifth classroom session, students were becoming bored and were anxious to drive. Starting at about the ninth classroom session, instructors mentioned, with increasing frequency, student disinterest in classroom work as being a problem. Student absences were cited as a problem by the 18th session.

Some difficulties were noted at the beginning of the program in the distribution and explanation of student schedules.

Distributing *all* of the student material at the beginning of the course was a more satisfactory arrangement than distributing one module or LAP at a time, which had been the original arrangement. Some students did not read independent study materials nor complete all the exercises.

Slide presentations would have been more useful if the slides had been up-to-date and of better quality. Multimedia presentations generally were described in such terms as "would have been very good, except for repeated equipment failures." (Several instructors suggested dropping multimedia presentations from the program because of equipment malfunctions. However, some of the difficulties may be attributed to a lack of instructor training in operating the equipment.) The films "Following Distances," "Perceptive Driving," "Control," "The Drinking Driver," and "Emergency Driving Procedures" were generally considered useful, effective, and superior to previous materials, although each received occasional specific complaints. The booklet "Mayday! Mayday!" was also found useful, but time restrictions limited its use during the Spring semester.

Several instructors mentioned that SPC students should receive greater preparation for the driver licensing written examination. Some also considered the grading system for the course to be vague and arbitrary.

Simulator. Even though some of the simulator units did not work properly, most instructors described the simulator as very helpful, especially in maintaining student interest. Some instructors felt that in the first two simulator sessions, other maneuvers should be added, providing more repetition and practice. In the third and fourth simulator sessions, lessons were considered helpful and effective, but most instructors felt that procedures for conducting sessions were difficult or impossible. The film "City Driving" in the fifth simulator session was considered effective by most, but some noted that students were becoming bored with the simulator at this point. The sixth simulator session, which featured the film "Crash Avoidance," was considered the best of the simulator sessions.

Testing. There were no major problems in the administration of the knowledge tests. However, instructors consistently noted that students resented having the questions read to them. (Tests were not read to students in the first pilot implementation, which required 30 to 35 minutes per test administration. Time was cut in half when tests were read to students.) Several of the tests were criticized for having questions that seemingly had more than one appropriate answer, while the Unit 6 test was noted as being unusually precise. Some instructors felt that having students grade each others' papers allowed cheating to become a problem. In the later sessions, students were reportedly tired of taking knowledge tests. In general, the tests were considered improved over the previous semester.

The Perceptual Skills Pre-Tests and Post-Tests posed no problems in administration, except that mechanical difficulties were reported on the pre-test, and two instructors were necessary for proper administration.

Recommendations for Range

Most range sessions were described as good, necessary, useful, and interesting to students. The most frequent complaint was that one of the ranges (East High School) was too small (approximately 150' x 200') for completion of most of the prescribed maneuvers.

Several instructors suggested that the backing maneuver be taught in the first range lesson (Preoperative Checks and Vehicle Starting and Stopping), rather than at the sixth range lesson where it was scheduled with parallel parking. They also suggested that the parallel parking maneuver in the sixth range session be delayed until very late in the training, because students did not seem to have sufficient skill at this point in their training.

Material in the second range lesson (Turns, Serpentine, and Lane Changes) was found to be too long and too advanced to complete in one session. The third range lesson (Following, Lane Position, and Gap Discrimination) was considered useful but unrelated to the upcoming Range Test. It was used by some of the instructors to complete the second range lesson.

A test was administered during the fourth range session, and instructors indicated that the definitions on the test were not specific enough. Some instructors felt their students were not ready for this test.

In all range sessions, an extra instructor (when available) was regarded as a considerable asset. For the sixth range lesson (Backing and Parallel Parking), instructors felt a second instructor was a necessity. In the seventh and eighth range lessons (Passing), the passing exercise was considered especially helpful.

Students were not well enough prepared for the tenth range lesson (Serpentine at 25 mph), instructors indicated. They felt the range layout was not adequate for this exercise, and that students had difficulty maintaining the prescribed speed. The 11th range lesson (Blocked Lane) was considered a very good exercise and was well received by the students. Some instructors felt that visual cues in the blocked lane exercise would be more realistic than auditory cues in simulating a traffic emergency.

Instructors criticized the range layout again in the 12th lesson (Controlled Braking). The last range lesson (Evasive Maneuvers Range Test) was considered "easy" to conduct, and improved over the test from the previous semester. However, some instructors again commented on the lack of specific rating instructions.

Range Rules. The range rules were considered helpful in telling students what was expected of them. The rules provided some consistency across instructors, which had been a problem in previous administrations of the program. Several instructors mentioned that range rules were soon forgotten by students, and one suggested posting rules in driver education vehicles.

Recommendations for On-Street

Most instructors felt that students in the Spring, 1974 pilot test were better prepared for on-street instruction than those in the two previous pilot tests, due to a revised sequence in the range lessons. While the on-street lessons were generally appropriate, the route for the second on-street lesson was too lengthy for the time allowed, some of the instructors felt, and too difficult for the students' skill level.

The instructors were particularly concerned with the highway driving lesson in the third on-street session. They felt that this lesson was scheduled before students had sufficient skill to complete the exercise safely. The lesson was considered especially dangerous for students in after-school classes, who had to drive during peak traffic periods. Most of the instructors felt that highway driving required more than one training session. They used the open session in the sixth on-street exposure, to repeat the highway driving session.

The off-road recovery lesson was considered effective, but instructors felt that the sites selected were inadequate, and that the exercise should be conducted at greater speeds and with more repetition.

Checklists. Checklists were judged to have been improved over earlier versions, but instructors felt that students still had problems in understanding them. Instructors indicated that one problem may have been the reluctance of some students to criticize their peers.

Progress Charts

The progress charts were generally rated useful for keeping the instructors informed about a student's progress. Instructors indicated that the charts used in the Spring pilot program were an improvement over those used in the previous semesters. Students who did not fully understand the purpose of the charts did not use their copies. Some instructors, too, failed to give them proper attention, or to emphasize that they would be checked frequently. Some instructors mentioned difficulty in understanding certain items on the charts, particularly those related to the on-street lesson on hazard perception.

SUBJECTIVE REACTION: STUDENT FEEDBACK

Handouts were given to students in both the Safe Performance Curriculum and the Pre-Driver Licensing course in order to obtain their feedback on the curricula. The results obtained from the 'Student Handout for Course Feedback" are shown at the end of this section. The handout, which served as a course evaluation questionnaire, is reproduced, and the combined data obtained from 171 PDL students and 170 SPC students at East, Southeast, and Northeast High Schools have been entered. The data from the SPC handout provide the primary format, with any differences in PDL data set off in brackets. Researchers' notes have been included to explain further or elaborate upon the data.

Most of the results are self-explanatory. The overall reaction to the instruction was favorable, and there was general agreement that both courses provided useful learning in an agreeable and worthwhile manner. Both groups of students, however, felt that more actual driving experience, especially on-street, was needed. Simulators were not considered a satisfactory substitute.

Two general observations regarding these students should be noted before the data are examined and interpreted:

(1) Some 20 to 30% of the total class populations are not represented in the questionnaires. The handouts were administered at course end, well into mid-summer, and many students had already left school for vacation. It is assumed that many of the respondents could be characterized as "more highly motivated" students, and their questionnaire responses would reflect this.

(2) It should be remembered, especially when comparing PDL and SPC data, that the majority of students in the PDL course were acutely aware that SPC students were receiving a longer, more intensive course of instruction. In some instances PDL students stated they would have preferred SPC placement. This awareness may explain, in part, the tendency of PDL data to present a somewhat more conservative assessment.

A copy of the Student Handout for Course Feedback, with data from both student groups, follows.

STUDENT HANDOUT FOR COURSE FEEDBACK

The Safe Performance Curriculum [PDL Course][1] is almost over. Think for a minute about what you got out of this course and then fill in this form. You won't be asked to put your name on the form, so feel free to respond honestly.

1. Put a number (from 1 to 6) [from 1 to 5] in each of the boxes below. Put number 1 in the box next to the thing that you liked the most and thought was most helpful; number 2 in the box next to the thing that you liked second-best, etc. . . . Number 6 [5] will be in the box next to what you thought was least helpful.

	SPC	*[PDL]*	
(Mean Ranks)[2]	*4.4*	[*4.3*]	Reading your LAPS
	4.5	[*3.6*]	Classroom
	4.8	[__]	Guided Learning*
	3.8	[*3.6*]	Simulator
	2.0	[*2.0*]	Range
	1.5	[*1.5*]	On-Street

**Did not appear on PDL Handout since Guided Learning was not included in the PDL Course.*

2.* I read my LAPS (*Learning Activities Packages*):

	SPC		
(Percent of students)	*43%*	Most of the time	(Check one and fill in your reason)
	52%	Some of the time	
	5%	Not at all	

Because: *Students commonly suggested that they did not always read their LAPS because they had too much other work or too many other activities that they deemed more important for their advancement as a student and individual fulfillment.*

**Did not appear on PDL Handout since PDL students received only 2 of 21 LAPS.*

3.[2.] I practiced driving outside the course about (fill in number)

	SPC	*[PDL]*		
(Median number of hours)	*4.3*	[*3.9*]	hours with:	A parent or guardian *(only)*
	4.4	[*2.3*] *		Other *Self, relative, friend (only)*
	6.5	[*13.8*] *		A parent or guardian and Other *Self, relative, friend*

**By course end, SPC students indicated that they drove alone outside the course 6% of the time and PDL students indicated that they drove alone outside the course 23% of the time.*

---

[1] Brackets indicate those places where the PDL Handout differed from the SPC Handout. Also, PDL student response data are enclosed in brackets.

[2] Italics indicate researchers' notes which have been added so as to explain and elaborate the student response data being reported.

(Continued)

4.* Put a number (from 1 to 8) in each of the boxes below. Put number 1 in the box next to the unit that you liked the most; number 2 in the box next to the unit that you liked second-best, etc. . . . Number 8 in the box next to the unit that you liked the least.

	SPC	
(Mean Ranks)	5.8	Unit 1: Introduction
	3.9	Unit 2: Basic Control Skills
	3.1	Unit 3: Normal Driving
	4.8	Unit 4: Environmental Factors
	4.8	Unit 5: Complex Perceptual Skills
	4.0	Unit 6: Driver Influences
	3.2	Unit 7: Emergency Skills
	6.2	Unit 8: Nonoperational Tasks

I liked the unit that I checked number 1 the best because: *Students preferred Unit 3 because it provided the greatest opportunity to operate a vehicle, especially on-street, and they felt experience was the best teacher. Unit 7 was instructive and exciting.*

I liked the unit that I checked number 8 the least because: *Students least preferred those units (1 and 8) which were exclusively devoted to classwork because they felt the instruction was unrelated to the driving task and that the work was sometimes boring.*

**Did not appear on PDL Handout since the PDL Course included only 2 of the 8 units.*

5.[3.] The classes in this course were:

	SPC	*[PDL]*		
(Percent of[1] students)	68.0%	[51.7%]	Very helpful	(Check one and make comments)
	26.3%	[33.2%]	Helpful	
	5.1%	[13.5%]	Sort of helpful	
	0	[1.7%]	Useless	
	0.5%	[0]	Other *"Boring"*	

Comments: *Commentary was generally very laudatory, praising instructors and class content. PDL students felt classroom work was overly emphasized in their course (in contrast to SPC), and that more actual driving experience was needed.*

6.* The Guided Learning sessions were:

	SPC		
(Percent of students)	17.7%	Very helpful	(Check one and make comments)
	31.7%	Helpful	
	39.7%	Sort of helpful	
	11.3%	Useless	
	0	Other *(None)*	

Comments: *Commentary suggested that guided learning didn't occur regularly or often, and that its primary value was remedial. Films were considered very beneficial.*

**Did not appear on PDL Handout.*

[1] Percent ≠ 100 due to rounding.

(Continued)

7.[4.] The simulator labs were:

	SPC	[PDL]		
(Percent of students)	16.0%	[17.1%]	Very helpful	(Check one and make comments)
	31.5%	[30.5%]	Helpful	
	41.5%	[38.7%]	Sort of helpful	
	10.4%	[10.3%]	Useless	
	0.5%	[3.3%]	Other *E.g. "Didn't attend", "Fun"*	

Comments: *Commentary suggested that the simulators were seldom operative, and that the device had very limited driving task fidelity. Students felt they gained an acquaintanceship with auto instrumentation and "the feel of a car".*

8.[5.] The range lessons were:

	SPC	[PDL]		
(Percent of students)	70.1%	[60.1%]	Very helpful	(Check one and make comments)
	24.2%	[33.7%]	Helpful	
	4.6%	[5.2%]	Sort of helpful	
	0.5%	[1.0%]	Useless	
	0.5%	[0]	Other *(None recorded)*	

Comments: *Commentary was generally very laudatory. Students felt it was particularly important to initially practice within a protected range before venturing onto streets.*

9.[6.] Driving on-street was:

	SPC	[PDL]		
(Percent of students)	87.4%	[84.8%]	Very helpful	(Check one and make comments)
	11.0%	[10.7%]	Helpful	
	1.1%	[4.0%]	Sort of helpful	
	0	[0]	Useless	
	0.5%	[0.5%]	Other *(None recorded)*	

Comments: *Commentary was extremely laudatory. Students felt it was essential to practice-drive under actual traffic conditions in order to learn and gain confidence.*

10.[7.] I though the teachers in this course were: *(Statement completion)*

	SPC	[PDL]	
(Content analysis of student statements: Percent of students)	30.9%	[42.9%]	Understanding/Patient
	37.6%	[37.2%]	Instructive/Helpful
	19.3%	[11.1%]	Good/Nice/Fun
	7.8%	[5.8%]	Okay/All right
	3.7%	[2.3%]	Negative Evaluation
	0.6%	[0.8%]	Irrelevant comments

Because: *(Statement Completion) Commentary suggested that students felt course instructors were especially patient with errors and understanding of inexperience. Instructors provided help in an instructive and constructive manner.*

(Continued)

11.[8.] I think this course would have been better if *(Statement completion)*

	SPC		*[PDL]*		
	Rank	*%*	*[Rank**	*%]*	
(Content analysis of student statements: Ranks and percent of students)	1.5	23.0%	[2	25.8%]	More driving time (on-street and range)
	1.5	23.0%	[3	16.7%]	More on-street driving
	3	9.0%	[13	0.8%]	More driving time/Less classwork
	4	6.6%	[1**	37.1%]	Longer, more intensive course
	5	5.7%	[6.5	2.3%]	Improved student motivation and interest
	6	4.9%	[4	5.3%]	No improvement necessary
	7	4.1%	[5	3.0%]	More instruction in parallel parking
			[	—	
		***23.4%		10.1%]	Miscellaneous *(E.g. Smaller classes; No teachers' strike; review of all tests; etc.)*

** PDL Ranks correspond to SPC categories.*

*** Acute awareness of more intensive SPC may be operative.*

**** Miscellaneous category; ranks greater than 7 for SPC and greater than 6.5 for PDL.*

12.[9.] Do you feel that you know how to drive safely now?

	SPC	*[PDL]*	
(Percent of students)	98%	[89%]	Yes
	2%	[11%]	No

13.[10.] I think this course taught me:

	SPC	*[PDL]*	
(Percent of students)	91%	[76%]	A lot
	9%	[24%]	Something
	0	[0]	Nothing

14.[11.] Having gone through the course, I feel it is *(Statement completion)*

	SPC	*[PDL]*	
(Content analysis of student statements: Percent of students)	36.9%	[43.2%]	Helpful/Useful/Worthwhile
	47.1%	[37.4%]	Great/Good
	10.6%	[7.6%]	Necessary
	4.1%	[9.9%]	Okay/All right
	1.3%	[0]	Negative evaluation
	0	[1.3%]	Irrelevant comments

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AND
APPENDICES

REFERENCES

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Appendix A

DRIVING KNOWLEDGE TEST

Test Administration Guidelines
- Pre-Test of Driving Knowledge
- Post-Test of Driving Knowledge

Driving Knowledge Test
- Form A
- Form B
- Correct Answers
- Criticality and Source Table

TEST ADMINISTRATION GUIDELINES

PRE-TEST OF DRIVING KNOWLEDGE

PURPOSE:

The pre-test of driving knowledge is a paper and pencil test consisting of 50 multiple choice items. It is designed to measure the extent of students' driving knowledge before exposure to the course materials. The same test will be administered to the students upon completion of the course in order to assess student attainment of curriculum knowledge objectives. A comparison of the two sets of scores will provide one measure of the extent to which exposure to the course has increased driving knowledge.

TEST ADMINISTRATION

Date: The second classroom session in Unit 1

Time Required: 20-30 minutes

Materials Required: (1) One test booklet for each student

(2) One set of instructions and an answer sheet (IBM) for each student (clip this to the front of the test booklet)

(3) One #2 pencil for each student

Test Room Conditions: Those conducive to good concentration and individual work

INSTRUCTIONS TO STUDENTS

"In class today you will be taking a multiple choice test on driving knowledge. This test is to find out what you might already know about driving before beginning the driving course. The results of this test will not affect your grade in any way. But the test scores will help us judge how effective the course is when we compare them to test scores when you have completed the course.

When you look at the test you will probably find that you don't know many of the answers. Don t worry. You aren't expected to. So just try to choose the answer that seems most correct to you.

It is important that you work individually and quietly.

I am going to hand out the test now. Please don't open the booklet until I say so. (Hand out test booklets with instructions and answer sheets clipped to the front of each, and pencils).

Detach the answer sheet from the test booklet and read the instructions carefully. (pause)

Are there any questions?

Remember - For each question, choose the ONE answer you consider MOST correct.
- Put your answers only on the answer sheet.

You have half an hour to complete the test. You may begin."

NOTE: Before collecting the test materials, ask students to ensure that their name, school and date are written on the answer sheet. The test should NOT be discussed.

SCORING

Tests are to be scored on a percentage basis. Assign two points to each correct answer. The sum of the points will represent the percentage score.

TEST ADMINISTRATION GUIDELINES

POST-TEST OF DRIVING KNOWLEDGE

PURPOSE:

The post-test of driving knowledge is a paper and pencil test consisting of 50 multiple choice items. This is the same test which was administered to students before exposure to the course. The post-test is designed to measure student attainment of the curriculum knowledge objectives upon the completion of the entire course.

TEST ADMINISTRATION

Date: The last day of classroom instruction

Time Required: 20 - 30 minutes

Materials Required:
- (1) One test booklet for each student
- (2) One set of instructions and an answer sheet for each student (clip this to the front of the test booklet)
- (3) One #2 pencil for each student

Test Room Conditions: Those conducive to good concentration and individual work

INSTRUCTIONS TO STUDENTS

"Today you will be taking the final knowledge test in the course. It consists of 50 questions and covers all of the units in the course. Like the previous tests, it is a multiple choice test. The results of this test will contribute to your final grade, along with the results of the Unit knowledge tests, the on-road performance test, the range tests and so on.

It is important that you work individually and quietly.

I am going to hand out the test now. Please don't open the booklet until I say so. (Hand out test booklets with instructions and answer sheets clipped to the front of each one, and pencils).

Detach the answer sheet from the test booklet and read the instructions carefully. (pause)

Are there any questions?

Remember - For each question, choose the ONE answer you consider MOST correct.

- Put your answers only on the answer sheet.

You have half an hour to complete the test. You may begin."

NOTE: Before collecting the test materials, ask students to check that their name, school, and date are written on the answer sheet. The test should NOT be discussed.

SCORING

Tests are to be scored on a percentage basis. Assign two points to each correct answer. The sum of the points will represent the percentage score.

DRIVING KNOWLEDGE TEST (PRE-TEST/POST-TEST)

INSTRUCTIONS

(To be attached to the front page of each test)

Please use the pencil provided

Take the Answer Sheet and:

- Where it says NAME write your name
- Write the name of your SCHOOL on the answer sheet
- Write today's DATE on the answer sheet

When you take the test, you should:

- Pick the ONE answer you think is MOST correct for each question
- Fill in the blank corresponding to the correct answer ON THE ANSWER SHEET
- Not write on the test itself

EXAMPLE: 1. A red traffic light means:

a) slow down
b) stop
c) go
d) turn

If you think "stop" is the correct answer, you would find the number "1" on the answer sheet and fill in the blank next to the letter "b".

FORM A

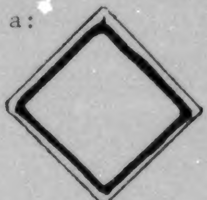
1.A. The inside rearview mirror should be adjusted to reflect the:

a) Center of the road behind the vehicle
b) Left side of the road behind the vehicle
c) Right side of the road behind the vehicle
d) Top of the trunk

2.A. When backing up, it is usually best to:

a) Open the left front door and look back
b) Steer with one hand while looking into the rearview mirror
c) Steer with one hand while looking out the rear window
d) Steer with both hands while looking out of the left side window

3.A. The shape of this sign tells you it is a:



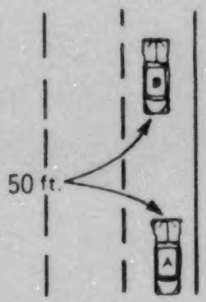
a) Stop sign
b) Speed limit sign
c) Warning sign
d) School crossing sign

4.A. When you come to a railroad crossing where there are several sets of tracks you should:

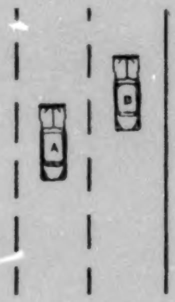
a) Wait until all the tracks are clear before you start to cross
b) Drive quickly to cross the tracks in as little time as possible
c) Stop and wait until a flagman signals you to cross
d) Move part way onto the tracks and then wait for the other tracks to clear

5.A. As Car A prepares to pass and passes Car B, in which position is A in the greatest danger from B?

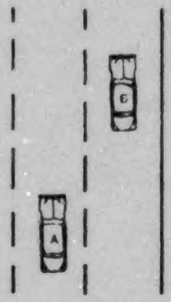
(a)



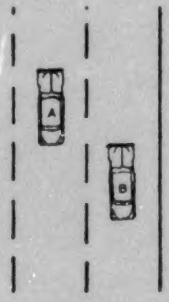
(b)



(c)



(d)



FORM A (continued)

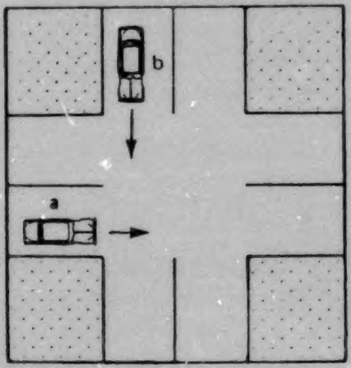
6.A. When you are planning to make a turn at an intersection, the best time to signal your turn, in most cases, is:

a) As soon as you've decided to make the turn
b) Whenever it will cause the least confusion
c) Approximately 150 feet from the intersection
d) When you begin to make the turn

7.A. In general, the safest driving speed on the roadway is:

a) 5 mph faster than the speed of the average car
b) 5 mph slower than the speed of the average car
c) The average speed of the other cars as long as that speed doesn't exceed the posted limit.
d) A speed that more or less constantly varies from the posted speed limit

8.A. The cars in the diagram below are approaching an intersection. There are no traffic signs or lights. Mark the letter on your answer sheet for the car that has the right-of-way.



9.A. A broken line painted on the center of the highway means:

a) You may pass or change lanes
b) Only drivers on the other side of the road may pass
c) You may not pass
d) Use extreme caution

FORM A (continued)

10.A. When driving on snowy or other slippery surfaces, smooth steady acceleration:

a) Is not as important as it is on dry surfaces
b) Helps keep the rear wheels from spinning
c) Is best accomplished by starting in low gear
d) Is no easier when using snow treads

11.A. When driving on snow or ice, do not:

a) Look at other vehicles to see if they are skidding
b) Wait until you reach the intersection before slowing down
c) Watch out for vehicles coming out of side streets
d) Look out for children playing near the street

12.A. If bad weather makes it hard for you to see, you should:

a) Speed up to get off the road quickly
b) Increase your following distance
c) Drive in the lane closest to on-coming traffic
d) Turn your lights on high beam

13.A. You should turn on your headlights:

a) Only between dusk and dawn
b) At night and on days when it is raining
c) At night and during severe snow storms
d) In all conditions of darkness

14.A. Which area is likely to be the most slippery after a rainfall during freezing weather?

a) The shoulders of the road
b) The roadway over a bridge or culvert
c) Roadways in sheltered areas
d) Areas paved with asphalt rather than concrete

15.A. On a two lane road, you should pass only when:

a) There is enough room to return safely to your lane after the pass
b) There is a solid line to the left of your lane
c) The vehicle ahead signals you to pass
d) The vehicle ahead is going more than 15 mph below the speed limit

FORM A (continued)

16.A. When driving in city traffic, you should:

a) Avoid using hand signals
b) Drive only in low gear
c) Expect other drivers to make quick stops
d) Leave only a small space between you and the vehicle ahead

17.A. Even if you feel in good condition after drinking, you should:

a) Realize that you won't be thinking as clearly as usual
b) Keep the radio on so you don't fall asleep
c) Spend more time than usual looking in the mirrors
d) Avoid using major highways

18.A. Prescription drugs taken in combination with alcoholic beverages:

a) Can cause trouble unless the drug was prescribed by a physician
b) Will tend to have their effects cancelled out by the effect of alcohol
c) Will cause trouble if you drink too much
d) Can produce extremely harmful effects

19.A. Which hand position on the steering wheel gives you the best control of the car during emergencies?

a) One hand at "10 o'clock" and one hand at "2 o'clock"
b) Both hands near the "12 o'clock" position
c) Both hands on the spokes
d) One hand at "9 o'clock" and one hand at "3 o'clock"

20.A. Your front wheels are most likely to skid if you:

a) Turn the wheel sharply
b) Speed up too quickly
c) Apply your brakes when backing up
d) Brake too hard

21.A. In order to get out of a skid, you should:

a) Keep your foot off the brake
b) Turn the front wheels toward the edge of the road
c) Let the steering wheel slip through your hands
d) Keep a constant pressure on the gas pedal

FORM A (continued)

22.A. If your brakes fail while you are on the roadway, the first thing you should do is:

- a) Keep your foot on the brake and wait until you get brake action again
- b) Turn off the ignition
- c) Leave the roadway
- d) Pump your brakes a few times

23.A. If a tire begins going flat while you are driving, you should:

- a) Drive quickly to the nearest service station
- b) Look for a safe place to pull off the road, then pull off
- c) Stop where you are and signal other traffic to go around you
- d) Pull off the road immediately, even if you can't get entirely off the road

24.A. Your tires will get worn in the middle if:

- a) They have too little air in them
- b) You make sharp turns
- c) They have too much air in them
- d) You do a lot of driving on gravel roads

25.A. When taking a long trip, you should limit your driving to:

- a) The distance your car can go without over-heating
- b) 4 hours a day with several rest stops
- c) 8 hours a day with several rest stops
- d) 12 hours a day with several rest stops

FORM B

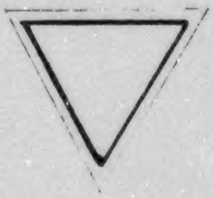
1.B. Before driving, you should adjust your sideview mirror so that you:

a) Do not see any part of your vehicle when you are sitting in your normal driving position
b) Just see the left edge of your vehicle when you lean to the left
c) See the rear window of your vehicle when you are sitting in your normal driving position
d) Just see the left edge of your vehicle when you are sitting in your normal driving position

2.B. The best way to be sure that it is safe to back up is to:

a) Look out the left side window
b) Look directly out the rear window
c) Look into the rearview mirror
d) Blow the horn and wait a few seconds

3.B. The shape of this sign indicates:



a) No passing zone
b) Stop
c) Yield right-of-way
d) Slow traffic keep right

4.B. When you come to a railroad crossing where the signal tells you a train is coming, the safest thing to do is:

a) Bring your car to a complete stop before you reach the signal
b) Slow down and look both ways
c) Continue at the same speed and check for a train before crossing
d) Estimate how fast the train is approaching and then cross the tracks

5.B. Before pulling out to pass a car, you should check the:

a) Outside and rearview mirrors
b) Rearview mirror
c) Outside and rearview mirrors, and look over the left shoulder
d) Outside mirror, rearview mirror, and then outside mirror again

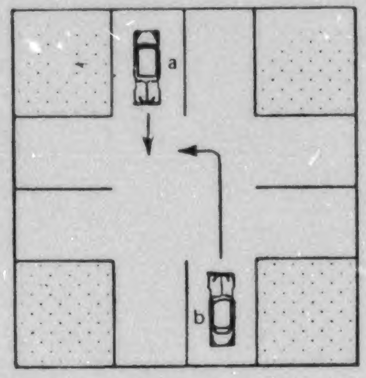
6.B. If you have to slow down quickly or make a sudden stop, you should:

a) Blow your horn before coming to a stop
b) Signal to the vehicle behind you if possible
c) Hold the steering wheel by the spokes
d) Shift into neutral before applying the brakes

7.B. Driving more slowly than the traffic flow:

a) Is usually a safe practice
b) Increases your chances of being struck from behind
c) Encourages other drivers to slow down
d) Is against the law

8.B. The cars in the diagram below have arrived at their positions at the same time. There are no traffic signs or lights. Mark the letter on your answer sheet for the car that has right-of-way.



9.B. A solid line and a broken line painted on the center of a two-lane highway mean:

a) Passing is not permitted when the solid line is on your side
b) Passing is permitted only when the solid line is on your side
c) Passing is permitted in either direction
d) Passing is not permitted in either direction

10.B. When driving on an upgrade covered with snow or ice, you can prevent wheel spinning by:

a) Increasing your speed when you begin to climb
b) Shifting into low gear before starting up
c) Maintaining a constant pressure on the accelerator
d) Applying the brakes every now and then

FORM B (continued)

11.B. If you are driving on icy roads in freezing weather, you should:

a) Approach curves and intersections slowly
b) Slow down after you enter curves or intersections
c) Drive at normal speeds if you have snow treads or chains
d) Stay in low gear most of the time

12.B. When it is very foggy during the day or night, you should:

a) Put on your high beam lights
b) Slow down
c) Follow closer to other vehicles
d) Turn on interior car light

13.B. At night you should drive slow enough to be able to stop within:

a) 5 car lengths
b) The distance lighted by your headlights
c) 200 feet
d) 10 seconds from the time you hit the brake

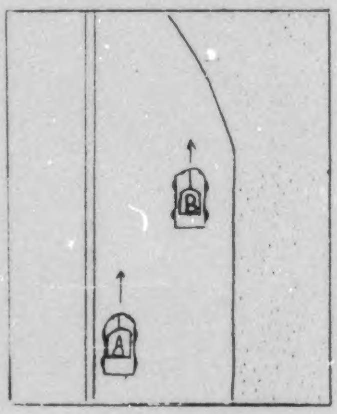
14.B. If the temperature drops below freezing after a rain:

a) Stop and put chains on as soon as possible
b) Do not driver faster than 35 mph
c) Test your brakes from time to time
d) Stop at every intersection

15.B. On a two lane highway, you should never:

a) Follow immediately after a vehicle that is making a pass
b) Pass a car that is towing a trailer
c) Pass a car signalling a right turn
d) Pass a car that is not going more than 15 mph below the speed limit

16.B. In a situation like the one illustrated in the diagram, the driver of Car A should:



a) Be prepared for Car B to cut in front of him
b) Pass Car B as soon as possible
c) Move to the right lane behind Car B
d) Sound his horn several times

17.B. Having one or two drinks before driving:

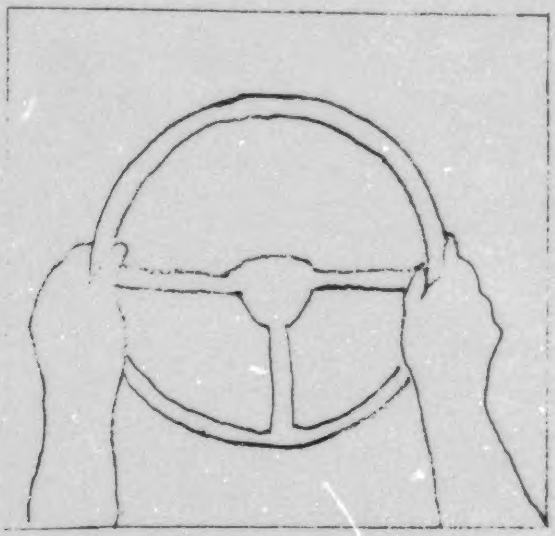
a) Is safe if you have been eating too
b) Has little or no effect on your driving ability
c) Will affect your reactions and judgment
d) Is illegal in most states

18.B. Before taking any drugs and then driving, it is important to:

a) Plan to have some other person with you
b) Know what the effects of the drug are
c) Have some food in your stomach
d) Plan on stopping every few hours

19.B. The hand position shown in the diagram is best for emergency situations because:

a) You won't sound the horn by mistake
b) You can keep from turning the wheel too sharply
c) You have better control over steering
d) It is easier to make a hand signal from this position



20.B. You are most likely to skid when:

- a) On asphalt roads, in tunnels, and when it is windy
- b) On curves, sand or gravel roads, and when making quick stops
- c) Making left turns, driving on bridges, and when speeding up
- d) Making turns on brick roads, backing up, and when at city intersections

21.B. If the rear of your vehicle is skidding to the left, you should:

- a) Turn the top of your steering wheel to the left
- b) Avoid moving the steering wheel till you are out of the skid
- c) Turn the top of your steering wheel to the right
- d) Turn the top of the steering wheel to the right and then to the left once you get traction

22.B. If your hood opens while driving, you should:

- a) Step on the brake and stop as fast as you can
- b) Signal for a stop and steer out of the main flow of traffic
- c) Avoid leaving the road since you cannot see where you are going
- d) Come to a stop on the road and put the hood down

23.B. When you have a flat tire on the highway, the most important thing to do is:

- a) Stop immediately so that the tire won't be damaged further
- b) Drive until you find a place where you can pull completely off the road
- c) Pull off the road without delay and set up flares
- d) Stop and turn on your emergency flashers

24.B. If your tires are badly worn, you should:

- a) Replace them
- b) Rotate them
- c) Avoid driving on hot days
- d) Have them balanced

25.B. When going on a long trip, it is most important to:

- a) Get plenty of rest before starting out
- b) Have someone else with you in the vehicle
- c) Have a good meal before starting out
- d) Keep the radio on

DRIVING KNOWLEDGE TEST

CORRECT ANSWERS

ITEM	FORM A	B
1	a	d
2	c	b
3	c	c
4	a	a
5	b	c
6	b	b
7	c	b
8	a	a
9	a	a
10	b	c
11	b	a
12	b	b
13	d	b
14	b	c
15	a	a
16	c	a
17	a	c
18	d	b
19	d	c
20	d	b
21	a	a
22	d	b
23	b	b
24	c	a
25	c	a

PRE/POST DRIVING KNOWLEDGE TEST

ITEM	LAP	FORM	SOURCE[1]	CRITICALITY RATING[2]
1	2-1	A	HSRI #7	MHC
1	2-1	B	HSRI #8	MHC
2	2-2	A	HSRI #319	MHC
2	2-2	B	DETA: 10 #13	MHC
3	3-1	A	HSRI #1072	MHC
3	3-1	B	HSRI #1080	MHC
4	3-1	A	HSRI #647	HC
4	3-1	B	NEW	HC
5	3-1	A	DETA: 10 #72	MHC
5	3-1	B	DETA: 10 #77	MHC
6	3-2	A	DETA: 10 #81	MHC
6	3-2	B	HSRI #906	MHC
7	3-3	A	DETA: 10 #10	MHC
7	3-3	B	DHB	MHC
8	3-4	A	DETA: 10 #90	MHC
8	3-4	B	DETA: 10 #91	MHC

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[1] HSRI: Item taken from Berger, W.G., et al., A Handbook for Driver License Knowledge Tests. Part II: Test Item Pool. Highway Safety Research Institute, University of Michigan, October, 1971.

DETA: 10: Item taken from the Driving Knowledge Test of the Driver Education Task Analysis Volume IV: The Development of Instructional Objectives. Human Resources Research Organization, Alexandria, Virginia, March, 1971.

NEW: Generated item.

[2] The criticality rating of the related driver task (HC = High Criticality: MHC = Moderately High Criticality; MC = Moderate Criticality; MLC = Moderately Low Criticality).

ITEM	LAP	FORM	SOURCE	CRITICALITY RATING
9	3-4	A	DETA: 10 #26	HC
9	3-4	B	HSRI #1247	HC
10	4-1	A	DETA: 10 #8	MHC
10	4-1	B	DETA: 10 #46	MHC
11	4-1	A	HSRI #372	HC
11	4-1	B	NEW	HC
12	4-2	A	HSRI #401	MHC
12	4-2	B	HSRI #406	HC
13	4-3	A	HSRI #619	HC
13	4-3	B	HSRI #621	HC
14	4-4	A	DETA: 10 #40	MHC
14	4-4	B	HSRI #413	MHC
15	5-1	A	HSRI #276	HC
15	5-1	B	NEW	HC
16	5-2	A	NEW	MLC
16	5-2	B	NEW	MLC
17	6-1	A	HSRI #665	HC
17	6-1	B	HSRI #673	HC
18	6-1	A	DETA: 10 #61	MHC
18	6-1	B	HSRI #678	MHC
19	7-1	A	NEW	MLC
19	7-1	B.	NEW	MLC
20	7-2	A	HSRI #440	HC
20	7-2	B	HSRI #437	HC

ITEM	LAP	FORM	SOURCE	CRITICALITY RATING
21	7-2	A	HSRI #443	HC
21	7-2	B	HSRI #446	HC
22	7-3	A	DETA: 10 #58	HC
22	7-3	B	HSRI #430	MHC
23	8-1	A	HSRI #434	MHC
23	8-1	B	NEW	MHC
24	8-2	A	HSRI #702	MLC
24	8-2	B	HSRI #705	MHC
25	8-3	A	HSRI #21	MLC
25	8-3	B	HSRI #23	MC

Appendix B

UNIT KNOWLEDGE TESTS

Test Administration Guidelines

Unit Knowledge Tests/Answers/
  Criticality and Source Table
    LAP 2-1
    LAP 2-2
    Unit 3
    Unit 4
    Unit 6
    Unit 7
    Unit 8
    Analysis of Variance for Unit Test
      Results, by Achievement Level
      and Sex

TEST ADMINISTRATION GUIDELINES

UNIT KNOWLEDGE TESTS

PURPOSE:

The unit knowledge tests are paper and pencil tests usually consisting of 10 multiple choice items. They are designed to measure student attainment of curriculum knowledge objectives for each unit.

TEST ADMINISTRATION:

Date: Generally, final classroom session for each unit. (Refer to "Assignment Schedule" in the Appendix to the Unit 1 Instructor Guidance Package for details.)

Time Required: 10-15 minutes

Materials Required:
(1) One test for each student
(2) One answer sheet for each student
(3) One #2 pencil for each student
(4) Answer rationale for each student (distributed after test administration)

Test Room Conditions: Those conducive to good concentration and individual work

INSTRUCTIONS TO STUDENTS:

Two sets of instructions follow. Set 1 should be used with classes of students who have "average" or better reading comprehension and speed. Set 2 may be employed when, in the instructor's judgment, reading the questions aloud to the class would appreciably improve students' comprehension of the test and save limited class time (i.e., set 2 is appropriate for classes comprised of slow readers).

Set 1

"Today you will be taking the knowledge test for Unit ___. It will be a short multiple choice test. The results of this test, in combination with the results from other unit knowledge tests, will contribute toward your final grade.

It is important that you work individually and quietly.

I am going to hand out the test now. Please don't start until I say so."

(Hand out tests with instructions and answer sheet clipped to the front of the test, and pencils.)

"Detach the answer sheet from the test and read the instructions carefully.

(Pause)

Are there any questions?

Remember - For each question, choose the ONE answer you consider most correct.

- Put your answers only on the answer sheet.

You have 15 minutes to complete the test. You may begin!"

Note: Before collecting the test materials, ask students to ensure that their name, school, and date are written on the answer sheet. Guidelines for discussion of knowledge tests are provided in the Instructor Guidance Package for each unit.

SCORING: The tests are to be scored on a percentage basis. Except for the Unit 3 knowledge test which has more than 10 items, assign 10 points to each correct answer. The sum of the points will represent the percentage score.

Set 2

"Today you will be taking the knowledge test for Unit ___. It will be a short multiple-choice test. The results of this test, in combination with the results from other unit knowledge tests, will contribute toward your final grade.

It is important that you work individually and quietly.

I am going to hand out the test now. Please don't start until I say so." (Hand out tests with instructions and answer sheet clipped to the front of the test, and the pencils.)

"Detach the answer sheet from the front of the test and put it to one side. I will be reading the test questions aloud when you take the test, but first we will read through the instructions. Read the instructions to yourself as I read them." (Read instructions and explain example item.)

"I will read the question and the four possible answers. Wait until I have finished reading all the answers before you choose your answer. I will then pause while you put your answer on the answer sheet before going on to the next question.

Are there any questions?

Remember - For each question, choose the ONE answer you think is MOST correct.

- Put your answers only on the answer sheet."

(Read first question . . .)

UNIT _____/LAP _____ KNOWLEDGE TEST

INSTRUCTIONS

(To be attached to the front page of each test)

Please use the pencil provided

Take the Answer Sheet and:

Where it says NAME write your name

Write the name of your SCHOOL on the Answer Sheet

Write today's DATE on the Answer Sheet

When you take the test, you should:

Pick the ONE answer you think is MOST correct for each question

Circle the correct answer ON THE ANSWER SHEET

Not write on the test itself

EXAMPLE: 1. A red traffic light means:

a) slow down

b) stop

c) go

d) turn

If you think "stop" is the correct answer, you would find the number "1" on the answer sheet and then circle the letter "b" (fill in the blank next to the letter "b" for IBM score sheet).

ANSWER SHEET

KNOWLEDGE TEST

This is a test for Unit (or LAP) ______________________________

Name: ______________________ School: ______________________

Date: ______________________

1. a b c d

2. a b c d

3. a b c d

4. a b c d

5. a b c d

6. a b c d

7. a b c d

8. a b c d

9. a b c d

10. a b c d

---

11. a b c d e

12. a b c d e

13. a b c d e

14. a b c d e

15. a b c d e

16. a b c d e

17. a b c d e

LAP 2-1

KNOWLEDGE TEST

The purpose of this test is to see if you have learned the material in LAP 2-1.

INSTRUCTIONS: For each test item, circle the letter on your answer sheet that corresponds to the answer you think is most correct.

1. Before you start the engine, which of the following should you do first?

    a) Adjust the mirrors.
    b) Adjust the driver's seat.
    c) Release the parking brake.
    d) Fasten your safety belts.

2. If you flood your engine when starting it, you should:

    a) Hold the accelerator all the way down while using the starter.
    b) Release the accelerator entirely while using the starter.
    c) Pump the accelerator up and down while using the starter.
    d) Put the selector lever in low and use the starter.

3. After you come to a stop and are waiting to continue, you should:

    a) Shift to park and step on the gas.
    b) Maintain firm pressure on the brake.
    c) Keep in slight motion by gently pressing gas.
    d) Shift to neutral and gently press gas.

4. When the generator (alternator) warning light comes on after the engine is started, it means that:

    a) The headlights are on high beam.
    b) There is hardly any oil left in the engine.
    c) Electricity is not being made and the car will soon stop.
    d) The parking brake is still on.

5. Right before shifting into Drive, you should:

    a) Release the parking brake.
    b) Take your foot off the brake pedal.
    c) Pump the accelerator once.
    d) Put your foot on the brake pedal.

6. When you want to come to a stop, you should:

   a) Ease up on the accelerator and rest your foot on the floor ready to apply the brakes.
   b) Keep one foot on the gas pedal and apply the brakes with the other.
   c) Release the accelerator and then apply the brakes.
   d) Keep one foot rear the parking brake in case the regular brakes fail.

7. For normal driving, the best way to hold the steering wheel is to keep:

   a) One hand at the "10 o'clock" position and one hand at the "2 o'clock" position.
   b) Both hands on the spokes of the steering wheel.
   c) One hand at the "3 o'clock" position and the other free to signal turns.
   d) Both hands at the "12 o'clock" position.

8. As your speed increases, you should:

   a) Make the same steering corrections as when you're driving slower.
   b) Make larger steering corrections.
   c) Avoid making steering corrections.
   d) Make smaller steering corrections.

9. In order to come to a slow, smooth stop, you should:

   a) Press the brake pedal more and more firmly until the vehicle stops.
   b) Keep an even pressure on the brake pedal until the vehicle stops.
   c) Gradually press harder on the brake and then ease up just before the vehicle stops.
   d) Pump the brakes several times as the vehicle begins to slow down.

10. To make a turn, a driver should slow:

   a) Before entering the turn.
   b) While in the turn.
   c) Before and while making the turn.
   d) Well before the turn and then speed up a little while going into the turn.

ANSWERS TO LAP 2-1 KNOWLEDGE TEST

1. (b) You should adjust the driver's seat before adjusting the mirrors, releasing the parking brake, or fastening your safety belts. Adjusting the mirrors or fastening safety belts before adjusting the driver's seat would probably mean that you'd have to re-adjust both mirrors and belts again -- after you were seated in the proper position. If your were to release the parking brake first, the vehicle may move before you're ready (e.g., if the gear selector had been left in neutral; if the engine was running and the gear selector was in drive or reverse; or if the driver failed to continue to hold the service brake down).

2. (a) If you flood your engine when starting it, you should hold the accelerator all the way down while using the starter. Answer a is the best answer because it is most likely to re-establish the proper fuel to air ratio in the combustion chamber. (When and internal combustion engine is flooded, the best immediate cure is to introduce as much air into the combustion chamber as possible.) Releasing the accelerator entirely (answer b) or pumping the accelerator (answer c) will only aggravate the situation. Answer d, putting the selector lever in low, is incorrect since the starter on most automatic transmission vehicles will not work when the selector is in low.

3. (b) After you come to a stop and are waiting to continue, you should maintain firm pressure on the brake. With your car in drive, it will probably tend to move along slowly even if you do not have your foot on the accelerator. By pressing on the brake pedal, you will hold the car steady. You should not shift to park or neutral, because it would take time to shift back into drive when the traffic starts up again.

4. (c) When the generator (alternator) warning light comes on after the engine is started, it means that electricity is not being made and the car will soon stop. The purpose of this warning light is to notify the driver that the electrical charging system in his vehicle is not working. The warning light does not tell you, however, the cause of the charging system malfunction. Answers a, b, and d are incorrect, since there is no electrical connection between the warning light circuit and the items mentioned.

5. (d) Right before shifting into Drive, you should put your foot on the brake pedal. This action will keep the vehicle in control until you're ready to move the vehicle. Releasing the parking brake (answer a) should be done after shifting to Drive. Pumping the accelerator (answer c) may be done well before shifting into Drive, but not "right before."

6. (c) When you want to come to a stop, you should release the accelerator and then apply the brakes. Doing these two things will cut driving power and induce a deceleration. The other answers do not accomplish these two things.

7. (a) For normal driving, the best way to hold the steering wheel is to keep one hand at the "10 o'clock" position and one hand at the "2 o'clock" position. This way, both hands are balanced on the steering wheel and you're ready to put the desired steering input into the vehicle for the situation. Using the spokes for steering (answer b) could hamper the driver if he needs to make a quick steering input. With only one hand on the wheel (answer c), the driver has little ability to make precise steering inputs. Having both hands at the same position (answer d) is almost like driving one-handed.

8. (d) As your speed increases, you should make smaller steering corrections. With smaller steering corrections, your vehicle will be positioned correctly at higher speeds. The result of larger steering corrections (answer b) will be exaggerated at higher speeds. Answer c (avoid making steering corrections) is incorrect, since any time a vehicle is moving, some steering corrections will be needed.

9. (c) In order to come to a slow, smooth stop, you should gradually press harder on the brake and then ease up just before the vehicle stops. The reason: the amount of braking force needed to decelerate is much more than the amount of braking force needed to bring the vehicle to a stop during the last instant of deceleration. Most drivers get in the habit of easing up on the brake before stopping to make the stop smooth at the end. By keeping an even pressure on the brake (answer b), a slight jerk will be felt when the vehicle stops. Answer d may be correct for emergency stops (it may generate greater amounts of deceleration force while allowing the driver to retain some steering control), but the question asked for a smooth stop.

10. (a) To make a turn, a driver should slow before entering the turn. Attempts to reduce speed in the turn may throw the car into a skid.

LAP 2-1

KNOWLEDGE TEST

ITEM	SOURCE	CRITICALITY RATING*
1.	New	MLC-MC
2.	HSRI #17	MLC
3.	Fall '73 Test #9	MHC
4.	New	MHC
5.	Fall '73 Test #7	MLC
6.	HSRI #107 (modified)	MC
7.	HSRI #17 (modified)	MHC
8.	New	MHC
9.	HSRI #113	MLC
10.	New	MHC

*The criticality rating of the related driver task (HC = High Criticality; MHC = Moderately High Criticality; MC = Moderate Criticality; MLC = Moderately Low Criticality).

LAP 2-2

KNOWLEDGE TEST

1. You should check behind you for pedestrians and other vehicles:

   a) Just after you start to back up.
   b) Before you begin to back up.
   c) After you have backed onto the road.
   d) Unless someone is helping you back up.

2. When backing up, you should:

   a) Allow less distance to stop than if going forward.
   b) Sound the horn before starting.
   c) Avoid making quick steering changes.
   d) Speed up slightly when turning.

3. The correct way to back up is to:

   a) Turn your body to the right so that you can see out the rear window and steer with your left hand.
   b) Turn your head slightly to the left toward the side mirror and steer with either hand.
   c) Look into the rearview mirror so that you can see behind you and steer with both hands.
   d) Look at the side mirror and steer with both hands.

4. The safest place to make a U-turn is usually:

   a) At or close to an intersection.
   b) Only on one-way streets.
   c) In the middle of a block.
   d) On entrances or exits of highways.

5. If you need to reverse your direction while driving, it is usually safest to:

   a) Turn into a driveway, then back out.
   b) Make a U-turn.
   c) Back up.
   d) Go around the block.

6. If you decide to use a driveway when turning around (a two-point turn), you should:

   a) Drive forward into the driveway and then turn while backing out into the traffic.
   b) Back into the driveway and then turn while moving forward into the traffic.
   c) Choose a driveway that has vehicles parked on either side of it at the curb.
   d) Keep your door opened so that you can see while backing out of the driveway.

7. Before you begin to back into a parallel parking space, you should:

   a) Signal the cars behind you to go around, if traffic permits.
   b) Put on your 4-way flashers to warn other cars.
   c) Sound your horn to warn other cars that you are about to reverse.
   d) Open your door and look for traffic behind you.

8. When parking on a hill, facing uphill, and there is no curb, you should:

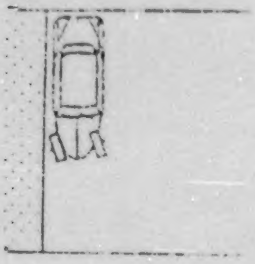
   a) Leave your front wheels straight.
   b) Turn your front wheels to the left.
   c) Park at a slight angle with rear wheels closer to the edge of the road.
   d) Turn your front wheels to the right.

9. When backing out of an angle parking space, you should begin turning your wheels:

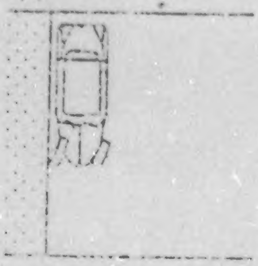
   a) As soon as your car is clear of vehicles on either side of you.
   b) Only when you are completely out into the traffic lane.
   c) As soon as you start to move backwards.
   d) Back and forth to ease your way out of the space.

10. Which way should the front wheels of a car be turned when parking downhill on a street?

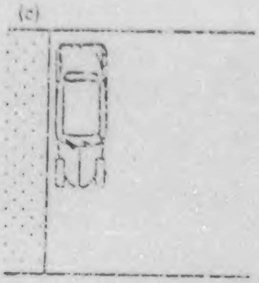
(a)



(b)



(c)



ANSWERS TO LAP 2-2 KNOWLEDGE TEST

1. (b) You should check behind you for pedestrians and other vehicles before you begin to back up. If you wait until you start backing before you check behind the car, you may run into something.

2. (c) When backing up, you should avoid making quick steering changes. You are steering with only one hand, and the job of coordinating your steering motions with the direction of the car is more complicated than when you are driving forward. Any quick or sharp steering movement is likely to be exaggerated and will call for another steering movement in the opposite direction to correct it, making it difficult to keep control of the car.

3. (a) The correct way to back up is to turn your body to the right so that you can see out the rear window and steer with your left hand. With your body turned in this direction you have the best possible view out the rear window, which allows you to see where you are going.

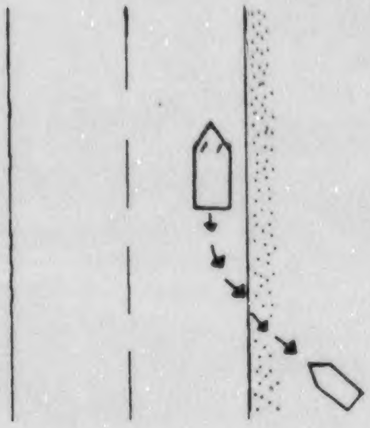
4. (c) The safest place to make a U-turn is usually in the middle of the block. You should make a U-turn where you have the least chance of getting in the way of other traffic. In the middle of the block, traffic can only be coming from two directions. If you made a U-turn at an intersection, traffic could come at you from four different directions. Making a U-turn at any kind of intersection or highway entrance means a greater chance of getting into problems with other traffic.

5. (d) If you need to reverse your direction while driving, it is usually safest to go around the block. With the other options (a, b, and c), you're more apt to come into conflict with other traffic.

6. (b) If you decide to use a driveway when turning around, you should back into the driveway and then turn while moving forward into the traffic. It is always dangerous to back into traffic from a driveway. If you are making a two-point turn, you should back into the driveway so that you can then drive forward into the traffic. Driveways with cars at either side of the curb should be avoided because the view of approaching traffic would be blocked, and the approaching cars would have trouble seeing you, too.

7. (a) Before you begin to back into a parallel parking space, you should signal the cars behind you to go around if traffic permits. When you stop on the roadway before you attempt to parallel park, you are blocking a lane of traffic. The cars behind you may have trouble seeing on-coming traffic and they may not realize that you are about to park. You can restore traffic flow by signalling to the cars behind you to go around you if you see that it is safe for them to do so. The other alternatives (b, c, and d) are unnecessary actions for parallel parking.

8. (d) When parking on a hill, facing uphill, and there is no curb, you should turn your front wheels to the right. This way, if for some reason your car should start rolling, it will roll away from the street. This will keep it from rolling into other moving traffic. If you left your wheels straight, the car could roll down the hill. With your wheels turned to the right, the car will roll away from the street and possibly into something that might stop it, such as a tree. The drawing below shows how your car will roll away from the street if your wheels are turned to the right.

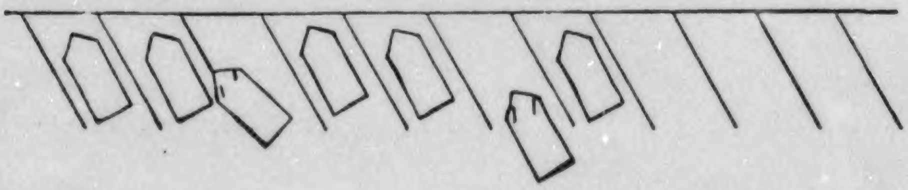


FACING UP HILL

WHEELS TO RIGHT

NO CURBING

9. (a) When backing out of an angle parking space, you should begin turning your wheels as soon as your car is clear of vehicles on either side of you. If you start to turn your wheels as soon as you start backing up, you could run into the car next to you. This is shown in the drawing below.



If you wait until you're completely out into the traffic lane (answer b), before you begin turning, you're likely to end up in the opposing lane of traffic. Answer d, turning "back and forth" is not necessary.

10. (b) Only when the wheels are in the position shown in (b), that is, turned toward the curb, could the car avoid rolling downhill, into a traffic lane, if the brakes failed to hold.

LAP 2-2

KNOWLEDGE TEST

ITEM	SOURCE	CRITICALITY RATING*
1.	Fall '73, Test #6	MHC
2.	HSRI #321	MC
3.	New	MHC
4.	Fall '73, Test #2	MHC
5.	HSRI #312	MC
6.	HSRI #311	MC
7.	HSRI #322	MHC
8.	Fall '73, Test #4	MC
9.	Fall '73, Test #8	MC
10.	DETA: IO #88	MLC

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*The criticality rating of the related driver task (HC = High Criticality; MHC = Moderately High Criticality; MC = Moderate Criticality; MLC = Moderately Low Criticality).

UNIT 3

KNOWLEDGE TEST

The purpose of this test is to see if you have learned the material in Unit 3.

INSTRUCTIONS: For each test item, circle the letter on your answer sheet that corresponds to the answer you think is most correct.

1. When entering an expressway, you should check traffic on the expressway by:

   a) Using the side mirror.
   b) Using the side mirror and rearview mirror.
   c) Using the side mirror and looking back over your shoulder.
   d) Using the side and rearview mirrors and looking back over your shoulder.

2. While driving in the city, you should generally focus your attention:

   a) On the vehicle just in front of you.
   b) About one block ahead of you.
   c) About five blocks ahead of you.
   d) Toward the right side of the roadway just in front of you.

3. When driving on a two-lane roadway with curves and hills, you should:

   a) Watch the roadside for warning signs.
   b) Always stay to the left side of your lane.
   c) Keep your headlights on at all times.
   d) Sound your horn frequently.

4. Using your turn indicators is important:

   a) Only when you are making turns at intersections.
   b) Only when you think there are other cars within sight.
   c) Only when you are making turns that cut across traffic.
   d) Whenever you change directions on the roadway.

5. Under which of the following conditions should you sound your horn before passing another car?

   a) At night.
   b) If the other car is signalling a right turn.
   c) When the other car is coming up (or closing) on a car ahead of it.
   d) Under any condition.

6. When entering a freeway with an entrance that has an acceleration lane, you should:

   a) Stop to check for traffic at the end of the acceleration lane.
   b) Enter the freeway at top speed and slow down to the speed limit afterward.
   c) Use the acceleration lane to get up to the speed of the freeway traffic.
   d) Use the shoulder to gain speed before you get onto the freeway.

7. If the driver of a car that is passing you signals that he must cut in front of you to avoid oncoming traffic, you should:

   a) Slow down to allow him to re-enter the lane in front of you.
   b) Speed up to let him get into the lane behind you.
   c) Quickly cut over to the shoulder.
   d) Continue at the same speed and keep in your lane.

8. You are nearing the top of a hill on a two-lane country road. As you approach the crest of the hill, you should:

   a) Speed up slightly.
   b) Maintain a steady speed.
   c) Apply the brakes lightly.
   d) Ease up slightly on the accelerator.

9. In general, how far behind the car ahead should you try to stay?

   a) Two car lengths.
   b) Two seconds.
   c) Two seconds for each ten miles per hour.
   d) Two car lengths for each ten miles per hour.

10. You should yield to a pedestrian:

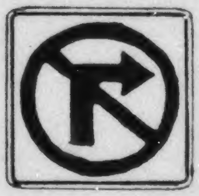
   a) Only when the pedestrian is on a crosswalk.
   b) Only if the traffic lights are in the pedestrian's favor.
   c) Only if doing so would not slow down the traffic flow.
   d) At all times, even if the pedestrian is not obeying traffic controls.

11. When you are driving down a residential street and there is no traffic in either direction, it is best to keep your car:

   a) Well to the right.
   b) Toward the left side of your lane.
   c) In the middle of your lane.
   d) In the middle of the street.

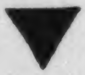
12. This sign means:

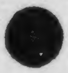
    a) No right turn.
    b) Do not enter.
    c) No U-turn.
    d) Right turn only.

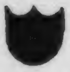


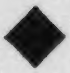
(Red & Black)

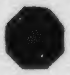
(13 - 17) Match the signs with their meanings. For example, if you think #13 is a "Stop" sign, you would put the letter "b" next to #13 on your answer sheet.

13. 

14. 

15. 

16. 

17. 

a. Interstate highway system.

b. Stop.

c. Railroad crossing.

d. Yield.

e. Caution.

ANSWERS TO UNIT 3 KNOWLEDGE TEST

1. (c) When entering an expressway, you should check traffic on the expressway by using the side mirror and looking back over your shoulder. You should check over your left shoulder to make sure of what you saw in the side mirror. You may see some things that you didn't see in the side mirror, because of the blind spot. While it's a good idea to use the rearview mirror, too, it won't tell you anything about traffic coming on the expressway. The rearview mirror will only tell you about traffic right behind you on the on-ramp.

2. (b) While driving in the city, you should generally focus your attention about one block ahead of you. Watching the driving environment one block ahead in the city will enable you to see what's happening within that block in time to cope with the situation. How far ahead you look is determined by how fast you are going and the type of environment in which you're driving. In the city, with speeds of about 25 to 30 mph and congested traffic conditions, you need to be observing about one block ahead in order to have time to react properly. Answer (a), "focusing your attention on the vehicle just in front of you," is not a safe way to observe; it tells you nothing about what's going on around you. Answer (d), "toward the right side of the roadway, just in front of you," is incorrect for the same reason as (a). Answer (c), "five blocks ahead," is much too far for city speeds and driving environment.

3. (a) When driving on a two-lane roadway with curves and hills, you should watch the roadside for warning signs. Roads with hills or curves are more dangerous than flat, straight roadways because of limited vision. Sometimes, it's hard to tell what lies beyond the next curve or hill. Warning signs will tell you, for example, that you are approaching a dip or a series of sharp curves. By looking out for these signs, you will be alerted to dangerous sections of the roadway and will have time to react accordingly.

4. (d) Using your turn indicators is important whenever you change directions on the roadway. Then, other drivers will be aware of what you intend to do and will be able to react accordingly. Unexpected actions can cause accidents, so always use your turn signals before you turn corners, change lanes, and enter or leave the roadway. Signalling should become a habit. Signal even if you think that there are no other cars near you--it's easy to be mistaken about this.

5. (c) You should sound your horn before passing another car when the other car is coming up (or closing) on a car ahead of it. The reason is that the other driver may be intending to pass the car ahead of him and may not be aware that you are passing him. Sounding your horn should be saved for times when it's needed. To sound your horn every time you pass is unnecessary (and annoying, if there's no reason to sound your horn).

6. (c) When entering a freeway with an entrance that has an acceleration lane, you should use the acceleration lane to get up to the speed of the freeway traffic. An entrance ramp that has an acceleration lane permits you to enter the expressway without interfering with the smooth flow of traffic because you are able to use the acceleration lane to increase your speed to that of the traffic on the expressway. Stopping or slowing down at the end of the acceleration lane would defeat the purpose of having one and invite a rear-end collision as well.

7. (a) If the driver of a car that is passing you signals that he must cut in front of you to avoid oncoming traffic, you should slow down to allow him to re-enter the lane in front of you. If a driver trying to pass you misjudges the speed and distance of on-coming traffic, you must help him return to his driving lane by speeding up or slowing down. In this case, he has signalled that he must cut in front of you, so the correct answer is to "slow down."

8. (d) You are nearing the top of a hill on a two lane country road. As you approach the crest of the hill, you should ease up slightly on the accelerator. Easing up on the accelerator will do two things for you. First, it will make sure that your car does not build up too much speed as you start down the hill. Second, it will make you more prepared to react in case someone that you couldn't see is in your lane as you go over the top of the hill. Do not apply your brakes, since you might interfere with traffic that is following behind you.

9. (b) In general, you should try to stay two seconds behind the car ahead. At nearly all speeds, a two second following distance will provide you with a safe space cushion. The two second rule automatically takes your speed into account. In other words, the faster you travel, the more distance you will cover during two seconds.

10. (d) You should yield to a pedestrian at all times, even if the pedestrian is not obeying traffic controls. Under any circumstances, drivers should be alert for pedestrians, and stop for them, if needed. Whether pedestrians are technically "in the right" or not, drivers must yield to them at all times.

11. (b) When you are driving down a residential street and there is no traffic in either direction, it is best to keep your car toward the left side of your lane. Most of your trouble on a residential street will come from the right side--children running into the street, cars backing out of driveways, people on bicycles, etc. By staying to the left side of your lane, you can keep a greater space cushion from these possible hazards. Don't move clear over to the left-hand side, though, or you may interfere with traffic from the opposite direction.

12. (a) This sign is the internationally accepted symbol for "NO RIGHT TURN." It is one of many signs that uses symbols to tell you where to position your car on the roadway.

13. d.

14. c.

15. a.

16. e.

17. b.

UNIT 3

KNOWLEDGE TEST

ITEM	SOURCE	CRITICALITY RATING*
1.	Fall '73, Test #1	MHC
2.	HSRI #129	MHC
3.	New	MHC
4.	New	MHC
5.	DETA: IO #75	MHC
6.	HSRI #496	MHC
7.	HSRI #551	HC
8.	Fall '73, Test #6	MHC
9.	Fall '73, Test #9	HC
10.	New	HC
11.	Fall '73, Test #3	MHC
12.	New	MHC
13.	DETA: IO #84	MHC

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*The criticality rating of the related driver task (HC = High Criticality; MHC = Moderately High Criticality; MC = Moderate Criticality; MLC = Moderately Low Criticality).

UNIT 4

KNOWLEDGE TEST

The purpose of this test is to see if you have learned the material in Unit 4.

INSTRUCTIONS: For each test item, circle the letter on your answer sheet that corresponds to the answer you think is most correct.

1. When driving over patches of ice, mud, or wet leaves, you should:

   a) Drive at the same speed as on a dry road.
   b) Follow closer to the vehicle ahead than usual.
   c) Avoid quick changes in speed or direction.
   d) Vary your speed often.

2. What is the best reason for not driving at high speeds when the roadway is covered with a layer of water?

   a) The spray from your car will make it hard for other drivers to see clearly.
   b) Your tires will tend to ride on top of the water.
   c) The spray from other cars will make it hard for you to see clearly.
   d) The spray may cause the engine to stop.

3. Whenever you are driving on snowy or icy roads, you should always:

   a) Allow for a much greater stopping distance than usual.
   b) Keep one foot resting on the brake.
   c) Drive 15 miles per hour less than the posted speed rate.
   d) Keep your car in high gear or "Drive."

4. You should look out for oily patches on the roadway, especially when:

   a) It is raining hard.
   b) You are driving in the city.
   c) You are on a cement roadway.
   d) It is a hot day.

5. Which of the following is most important when you are deciding how fast you should drive in the fog?

   a) How far you can see.
   b) How quickly you can stop.
   c) The amount of traffic.
   d) Whether it is day or night.

6. When bad weather makes it hard for you to see, you should:

   a) Drive on the shoulder of the roadway.
   b) Drive in the lane closest to the middle of the road.
   c) Drive in the lane that separates you most from other traffic.
   d) Drive only on divided highways.

7. The best reason for driving more slowly at night than during the day is that:

   a) There is less traffic to keep you alert.
   b) You may get sleepy.
   c) You cannot see as far ahead.
   d) Drivers tend to be more careless at night.

8. If the glare from the headlights of an oncoming car blinds you, you should:

   a) Squint your eyes, keeping them on the center of the lane in which the oncoming car is traveling.
   b) Focus your eyes on the right side of the roadway, just beyond the oncoming vehicle.
   c) Try to maintain normal eye position, since any movement away will be dangerous.
   d) Look down if the road is straight, and lift your eyes when the oncoming vehicle has passed.

9. To keep the engine cool when standing in heavy traffic during a period of extreme heat, you should:

   a) Turn off the engine until traffic begins to move.
   b) Shift to neutral and let the engine idle.
   c) Shift to neutral and race the engine slightly.
   d) Turn the engine off occasionally.

10. Which of the following is the best reason for slowing down when there are strong or gusty winds?

    a) It helps the car to grip the road better.
    b) It helps you "feel" wind effects more quickly.
    c) It will help you keep within the speed limit should the wind cause you to go faster.
    d) It gives you more time to react to change in your car's position caused by the wind.

ANSWERS TO UNIT 4 KNOWLEDGE TEST

1. (c) When driving over patches of ice, mud, or wet leaves, you should avoid making quick changes in speed or direction. Ice, mud, and wet leaves form extremely slippery surfaces, causing limited traction. Sudden braking or changing direction can put your car into a skid. It is best to keep speed and direction steady until you are back onto dry road.

2. (b) The best reason for not driving at high speeds when there is a thin layer of water on the roadway is that your tires will tend to ride on top of the water. This is often called hydroplaning. It can cause you to lose control of the car's steering and braking. Slowing down reduces the chance that your car will hydroplane.

3. (a) Whenever you are driving on snowy or icy roads, you should always allow for a much greater stopping distance than usual. On wet pavement, stopping distance is increased by about 50%. Hard packed snow increases stopping distance by 200%, and glare ice increases it by at least 500%. Of course, the faster you are going, the greater the stopping distance you should allow.

4. (d) You should look out for oily patches on the roadway especially when it is a hot day. In hot weather, oil in the pavement tends to come to the top, forming shiny patches that can be very slippery.

5. (a) In fog, you should be driving no faster than you can see; that is, you should be driving slowly enough to stop before reaching any obstacle that suddenly appears in the roadway. Many accidents occur because drivers assume there is nothing in the roadway; they believe because they can see the road right in front of them, they are safe.

6. (c) When bad weather makes it hard for you to see, you should drive in the lane that separates you most from other traffic. In fog, heavy rain or snow, your visibility is reduced and so is the visibility of other drivers on the road. In these conditions, your chances of being in a collision are greatly increased. The greater the distance between you and other traffic, the less likely you are to be in an accident.

7. (c) The best reason for driving more slowly at night than during the day is that at night you cannot see as far ahead. You should slow down at night to your distance of sight, so that you can stop within that distance. If you are not driving slowly enough, you may not have enough time to stop before you hit an object that had been out of your range of vision.

8. (b) If the glare from the headlights of an oncoming car blinds you, you should focus your eyes along the right side of the roadway just beyond the oncoming vehicle. This minimizes the effects of the glare and allows you to see the edge of the roadway. Don't try to give the other driver "a dose of his own medicine" by putting your headlights on high beam, too. Your chances of having a head-on collision are even greater when the other driver can't see either.

9. (c) To keep the engine cool when standing in heavy traffic during a period of extreme heat, you should shift to neutral and race the engine slightly. This will make the fan turn faster and will keep water moving through your cooling system.

10. (d) The best reason for slowing down when there are strong or gusty winds is because it gives you more time to react to change in your car's position caused by the wind. For example, a cross-wind can cause your car to move sideways into another lane of traffic. The faster you're going, the more your car will move sideways, allowing you less time to recover (that is, steer in the opposite direction).

UNIT 4

KNOWLEDGE TEST

ITEM	SOURCE	CRITICALITY RATING[*]
1.	HSRI #353	MHC
2.	Fall '73, Test #1	MHC
3.	New	HC
4.	New	MHC
5.	DETA: IO #66	HC
6.	New	MHC
7.	HSRI #620	MHC
8.	DETA: IO #56	MHC
9.	DETA: IO #51	MC
10.	DETA: IO #67 (modified)	MC

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[*] The criticality rating of the related driver task (HC = High Criticality; MHC = Moderately High Criticality; MC = Moderate Criticality; MLC = Moderately Low Criticality).

UNIT 6

KNOWLEDGE TEST

The purpose of this test is to see if you have learned the material in UNIT 6.

INSTRUCTIONS: For each test item, circle the letter on your answer sheet that corresponds to the answer you think is most correct.

1. Alcohol has the first and greatest effect upon your:

   a) Coordination.
   b) Ability to see clearly.
   c) Ability to remember.
   d) Judgement.

2. Which of the following statements about the relationship between eating food and drinking alcohol is the most accurate?

   a) Eating while you are drinking keeps you from getting high.
   b) Eating while you are drinking reduces your blood alcohol concentration.
   c) Eating while you are drinking has no effect on your blood alcohol concentration.
   d) You should eat while you are drinking rather than before you drink.

3. Bob and Mike arrived at a party together. In the first hour, before any food was served, Bob drank two 12-ounce cans of beer and Mike drank three 4-ounce glasses of whiskey. Bob and Mike both weigh about the same amount. At the end of the first hour of the party, which of the following statements about their blood alcohol concentration (BAC) would be the most accurate?

   a) Mike's BAC was higher than Bob's.
   b) Bob's BAC was higher than Mike's.
   c) Their BAC's were about the same.
   d) Their BAC was too small to be measured.

4. You have been at a party for several hours and a friend offers you a ride home. You know that he has been drinking. Which of the following should be the least important in making your decision to accept or refuse the ride?

   a) The number of drinks your friend has had.
   b) The extent of your friend's driving experience.
   c) The fact that your friend says he feels fine and can drive safely.
   d) The length of time since your friend had his last drink.

5. If you have been drinking at the rate of one drink an hour, what is the minimum length of time you should wait before driving anywhere?

   a) About half an hour.
   b) About one hour.
   c) About an hour and a half.
   d) About two hours.

6. If you have had too much to drink and you want to drive, a few cups of strong black coffee will:

   a) Do no good.
   b) Help you sober up a little.
   c) Help you think a little more clearly for a short while.
   d) Keep you from passing out at the wheel.

7. If you are taking medicine for a cold, you should:

   a) Not drive with anyone else in your car.
   b) Not drive just after taking the medicine.
   c) Only drive if it is an emergency.
   d) Know the effects that the medicine has on you before you drive.

8. If you are angry or upset, you should:

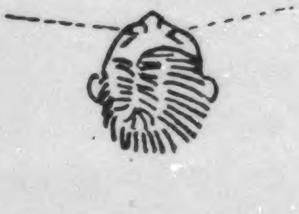
   a) Go for a drive to take your mind off your problems.
   b) Control your emotions while you are driving.
   c) Take some medicine to calm you down before you drive.
   d) "Cool off" before you drive anywhere.

9. It is generally safe to drive after taking:

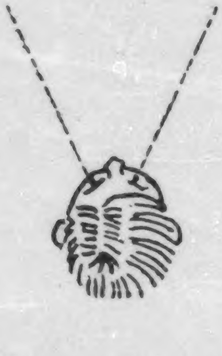
   a) Sedatives.
   b) Tranquilizers.
   c) Aspirin.
   d) Antihistamines.

10. Which of the diagrams below shows a person whose field of vision does not meet the minimum requirements for safe driving?

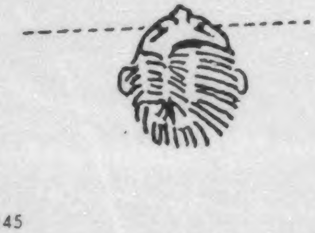
(a)



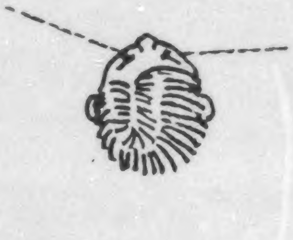
(b)



(c)



(d)



ANSWERS TO UNIT 6 KNOWLEDGE TEST

1. (d) Alcohol has the first and greatest effect upon your judgement. While it is true that alcohol does affect coordination, ability to see clearly, and ability to remember, it has the first and greatest effect upon your judgement.

2. (b) Eating while you are drinking, i.e., having food in your stomach, reduces blood alcohol concentration. Food cannot keep you from getting high. If a person drinks on an empty stomach, he will reach a higher blood alcohol concentration faster than if he drinks with some food in his stomach. However, no amount of food can keep alcohol from influencing the way a person drives.

3. (a) At the end of the first hour of the party Mike's blood alcohol concentration should be higher than Bob's. One twelve ounce can of beer and a one ounce shot of whiskey contain about the same amount of alcohol. If Bob had two beers and Mike had three glasses of whiskey, then Mike has consumed more alcohol. Since other factors are equal - Mike and Bob have similar weights, neither of them have eaten, and they have both been drinking for an hour, Mike, who drank the most alcohol, should have the higher blood alcohol concentration.

4. (c) The fact that your friend says that he feels fine and can drive safely should have very little influence on your decision to refuse or accept his offer of a ride. The ability to make sound judgements is greatly affected by drinking. In fact, people who have been drinking often feel that their driving skills are improved. Any of the other three alternative answers offer useful information for deciding if your friend is able to drive safely. If you think someone has had too much to drink, don't be a passenger in his car and, if possible, try to convince him not to get behind the wheel.

5. (b) If you have been drinking at the rate of one drink an hour, you should wait [illegible] minimum of one hour before driving. Alcohol leaves the body at about the rate of one drink an hour (the less you weigh, the longer it will take). If you wait at least one hour after you've had your last drink before you drive, your blood alcohol concentration will probably be sufficiently low for you to drive safely. Remember this applies only if you have been drinking at the rate of one drink an hour. If you have had several drinks in a short time, then you should wait one hour for each drink in order to be sure that enough of the alcohol has left your system.

6. (a) If you have had too much to drink and you want to drive, a few cups of strong black coffee will do no good. The idea that black coffee will sober you up is a myth. The only thing that will sober you up is time, because with the passing of time, your blood alcohol concentration grows smaller. Coffee will not reduce your blood alcohol concentration.

7. (d) If you are taking medicine for a cold, you should know what effects the medicine has on you before you drive. Even such over-the-counter, non-prescription drugs as cold remedies can have side effects that affect your driving ability. Not every person will react in the same way to a particular drug, so be aware of how you react before you drive. If the drug has effects that would impair your ability to drive in any way, don't drive after taking it. If the label warns that the drug may cause drowsiness or dizziness, do not drive.

8. (d) If you are angry, upset, or in any way emotionally disturbed, you should "cool off" before you drive anywhere. When you are in a poor emotional state, you are not able to make sound decisions or perceive things as readily as you do when you are calm. Your mind is not on driving, which requires full concentration.

9. (c) It is generally safe to drive after taking aspirin. Most people suffer no side-effects from taking aspirin. If you do, don't drive after taking it. On the other hand, sedatives, tranquilizers, and antihistamines can all have a depressant effect, making the person that takes them feel drowsy, lethargic and unable to think clearly. Obviously, it is dangerous to drive under these conditions.

10. (b) The person in diagram (b) does not have a wide enough field of vision to meet the minimum requirements for safe driving. The normal field of vision is shown in diagram (c) - it is a full 180 degrees. The persons in diagrams (a) and (d) don't have quite the normal field of vision but they exceed the 140 degree limit for safe driving. The person in diagram (b) has a very limited field of vision - much less than 140 degrees, and would be a hazard on the roads.

UNIT 6

KNOWLEDGE TEST

ITEM	SOURCE	CRITICALITY RATING*
1.	Fall '73, Test #8	HC
2.	Fall '73, Test #3	MC
3.	New	MHC
4.	New	MHC
5.	New	HC
6.	DETA: IO #78	MC
7.	HSRI #694	MHC
8.	HSRI #697	HC
9.	HSRI #680	HC
10.	New	MHC

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*The criticality rating of the related driver task (HC = High Criticality; MHC = Moderately High Criticality; MC = Moderate Criticality; MLC = Moderately Low Criticality).

UNIT 7

KNOWLEDGE TEST

The purpose of this test is to see if you have learned the material in UNIT 7.

INSTRUCTIONS: For each test item, circle the letter on your answer sheet that corresponds to the answer you think is most correct.

1. As you come over the top of a hill, you see a car stalled in your lane right in front of you. You cannot stop in time. There is a car approaching in the opposite lane. However, the shoulder on the right is wide and clear. What should you do?

   a) Hit the brake hard and try to steer around the car to the right.
   b) Accelerate and try to steer around the car to the left.
   c) Apply a hard, steady pressure to the brake and try to steer around the car to the right.
   d) Leave your foot off the brake and try to steer around the car to the right.

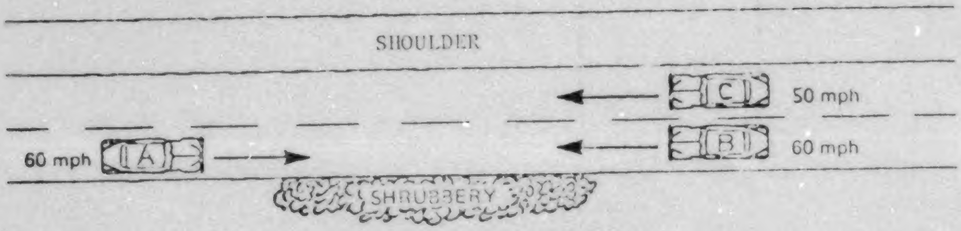
2. It is a sunny day and you are driving along a two lane road in the country. As you look at the scenery, your right wheels drop off the roadway onto a gravel shoulder. Beyond the shoulder is a four-foot drop into a ditch. The first thing you should do is:

   a) Brake hard, keep the steering wheel straight, and check for traffic.
   b) Grip the steering wheel firmly, check for traffic, and ease off on the accelerator.
   c) Brake hard, check for traffic, and jerk the steering wheel to the left to get the car back on the roadway.
   d) Accelerate slightly, check for traffic, and jerk the steering wheel to the left to get the car back on the roadway.

3. If it appears certain that you will be in a head-on crash, you should:

   a) Put on your brakes and stay in the center of your lane.
   b) Remove your seat belt and try to jump out of your car.
   c) Try to sideswipe, rather than hit the vehicle head-on.
   d) Lean forward over the steering wheel.

4.



In the collision situation above, the best course of action for Car A is to:

a) Maintain his course and hope that Car B returns to his proper lane.
b) Pull off the road into the shrubbery at the right.
c) Pull off the road onto the shoulder at his left.
d) Hit the brakes and try to stop.

5. When you are coming out of a skid, you should begin to straighten your wheels:

a) As soon as your speed drops below 10 mph.
b) After you have come to a complete stop.
c) When you are several yards from where you started to skid.
d) Just before the front of the car becomes even with the back.

6. You have just gone into a skid on an icy stretch of roadway and your tires are spinning. You should:

a) Quickly take your foot off the accelerator until the wheels stop spinning.
b) Accelerate slightly until you feel the wheels regaining traction.
c) Ease off the accelerator until the wheels stop spinning.
d) Apply the brakes to stop the wheels from spinning.

7. You are driving along a straight stretch of freeway surrounded by traffic, when you hear a loud "pow" and the rear of your car begins to shake. The first thing you should do is:

a) Brake hard to reduce your speed quickly.
b) Quickly take your foot off the accelerator.
c) Brake gradually.
d) Try to hold the steering wheel straight and avoid braking.

8. You are driving your car (equipped with power steering and power brakes) in traffic. As you approach a stop light, you take your foot off the accelerator, but the engine does not slow down. The accelerator is stuck. The first thing you should do is:

a) Place the car in neutral.
b) Reach down and lift up the accelerator.
c) Turn off the ignition.
d) Try to lift up the accelerator with your foot.

9. As you are driving along a roadway, you start to smell smoke which you think is coming from your car. You should:

   a) Look around your car for the source of the smoke.
   b) Open the window and drive until you reach a place where you can get some help.
   c) Realize that you are probably smelling exhaust fumes and inspect your car later.
   d) Pull completely off the roadway at the first safe opportunity.

10. If your brakes fail while driving in traffic, you should not:

   a) Steer onto a shoulder, curb, or open space.
   b) Use your horn or lights to warn other drivers.
   c) Apply the parking brake suddenly.
   d) Look for a guard rail, shrubbery or even parked cars to sideswipe.

ANSWERS TO UNIT 7 KNOWLEDGE TEST

1. (d) In making a sudden evasive maneuver, you should "leave your foot off the brake and try to steer around the car." When you are making an evasive maneuver, you need complete control of your car. When you apply your brakes, it's very easy to lock the wheels and cause the car to skid. If you were a good distance from the car ahead, then it would make sense to slow down as much as you could before leaving the roadway. Steering left around the car in this situation would put you on a head-on course with the car approaching in the opposite lane. The shoulder is wide and clear, so you should steer around the car to the right in this situation.

2. (b) The first thing you should do in a situation like this is to grip the wheel firmly (your hands at 9 and 3), check for traffic, and ease off on the accelerator. By having a proper grip on the steering wheel you will be in the best position to keep control over your car. You should not slam on the brakes because two of your wheels are on a low-traction surface--the loose gravel. Hard braking could cause a skid and further loss of control. To slow down before steering back onto the roadway, ease your foot off the accelerator.

3. (c) If it appears certain that you will be in a head-on crash, you should try to sideswipe, rather than hit the vehicle head-on. Remember, there are things you can do to "lessen the impact" in an unavoidable collision. One of these is to sideswipe an object, rather than hitting it head-on, if you have the choice. Answers a and d still leave you on a head-on collision course with the other car. This should be avoided if at all possible. Answer b, "jumping out of the car," would be more dangerous than staying in the car with your seat belt fastened.

4. (b) The best course of action for Car A in this situation is to pull off the road and into the shrubbery. This way he risks only minor injury and damage. By maintaining his course, he could escape a collision if the other driver altered his course; however, he is more likely to be killed or disabled for life. Attempting to reach the shoulder on the left will put him right in the path of Cars B and C. Car C is likely to end up on the shoulder in this situation, should Car B try to return to his lane. Hitting the brakes may put the car in a skid and make it totally uncontrollable.

5. (d) When you are coming out of a skid, you should begin to straighten your wheels just before the front of the car becomes even with the back. This will get you back on course and heading in the direction you want to go. Waiting until your speed drops or until the car comes to a complete stop (answers a and b) may only make the situation worse. How many yards you are from where you started to skid (answer c) is not a consideration in straightening the wheels. How far your car travels after it starts to skid will depend on the situation.

6. (c) When you have gone into a skid and the tires are spinning, you should ease off the accelerator until the wheels stop spinning. If you take your foot off the accelerator quickly, engine braking will be applied, which might make the skid worse. Applying the brakes will also worsen the skid and may lock the wheels--leaving you with no steering control. Since too much acceleration caused the skid, more won't get you out of it. The gradual reduction in speed necessary to bring the car under control is best achieved by easing your foot off the accelerator.

7. (d) If you hear a loud "pow" and the car shakes, you should try to hold the steering wheel straight and avoid braking. You have just had a blow-out in one of your rear tires. Steering right or left will cause the car to sway from side to side. Since you are surrounded by other vehicles, it is important to retain steering control of your car. Don't apply the brake until you have slowed down and have the car under control.

8. (a) If your accelerator sticks in a car with power brakes and steering, your first action should be to put the car in neutral. Since you are in traffic you don't have the time or space to fool around with the accelerator with your hand or foot, and you should never take your eyes off the roadway. If you turn off the ignition in a car like this, you have no power for your brakes or steering. This is dangerous because you are still in traffic and you need the control. By putting the car in neutral, you are disengaging the engine. However, be careful not to accidentally put the car into reverse.

9. (d) If you start to smell smoke coming from your car you should pull off the roadway at the first safe opportunity. The fire could be minor, but it could also be ready to flare up into something serious. Don't look for it while you are driving as you will have to take your eyes off the road. Look for it when you have stopped. If there is a fire, don't spend too much time trying to put it out, since it may spread to the gas tank and you won't want to be near your car when this happens.

10. (c) If your brakes fail when you are driving in traffic, you should not apply the parking brake suddenly. Sudden application of the parking brake, even at low speeds, can cause a skid. Alternatives (a) and (b) provide acceptable evasive actions in an emergency situation such as this, while (b) lets other drivers know that you are in trouble and to steer clear.

UNIT 7

KNOWLEDGE TEST

ITEM	SOURCE	CRITICALITY RATING*
1.	Fall '73, Test #2	HC
2.	New	MHC
3.	HSRI #580/585 (modified)	MHC
4.	DETA: IO #27	HC
5.	HSRI #448 (modified)	MHC
6.	New	MHC
7.	Fall '73, Test #5 (modified)	MHC
8.	Fall '73, Test #8 (modified)	MC
9.	New	MHC
10.	HSRI #423	HC

*The criticality rating of the related driver task (HC = High Criticality; MHC = Moderately High Criticality; MC = Moderate Criticality; MLC = Moderately Low Criticality).

UNIT 8

KNOWLEDGE TEST

The purpose of this test is to see if you have learned the material in UNIT 8.

INSTRUCTIONS: For each test item, circle the letter on your answer sheet that corresponds to the answer you think is most correct.

1. When a car is disabled and cannot be removed from the roadway at night, flares should be placed:

    a) At least 100 feet behind the car.
    b) At least 200 feet behind the car.
    c) At least 100 yards behind the car.
    d) At least 200 yards behind the car.

2. Which of the following is true concerning the use of jumper cables to start a car?

    a) The negative terminal of one battery should be connected to the positive terminal of the other.
    b) The positive terminal of one battery should be connected to the positive terminal of the other.
    c) The car with the good (booster) battery should always have its engine turned off.
    d) The water level in the discharged battery should be checked after it has been "jumped."

3. You are driving in slow traffic on a very hot day. You notice that your temperature gauge is rising into the "HOT" zone. The first thing you should do is:

    a) Turn off the air conditioner (if there is one) and turn on the heater.
    b) Idle the engine slowly.
    c) Place the car in low gear.
    d) Put the car in neutral and race the engine slightly.

4. Your right rear tire has gone flat, and you have pulled completely off the roadway to a place where the shoulder is level. Before jacking up the car, you should:

    a) Put the car in park.
    b) Put the car in park and apply the parking brake.
    c) Put the car in park, apply the parking brake, and block the wheel that is diagonally across from the flat tire.
    d) Put the car in park, apply the parking brake, and block the wheel that is on the same side of the car as the flat tire.

5. You have had a breakdown at night on a freeway. After pulling off the road, your safest plan of action is to:

   a) Turn on your parking lights and wait for help.
   b) Turn on your four-way flashers and wait for help.
   c) Try to flag down another car.
   d) Walk to the nearest service station for help.

6. Because you were distracted momentarily, you accidently strike a car ahead of you that has stopped suddenly. You should:

   a) Admit to the other driver that the accident was your fault.
   b) Provide the other driver only your name, address, license and registration numbers, and the name of your insurance company.
   c) Provide the other driver with your name, address, license and registration numbers, name of your insurance compnay, and the names of any passengers who might serve as witnesses.
   d) Make an on-the-spot settlement of damages if the other driver requests it.

7. When checking for steering or suspension problems, it will not help to:

   a) Check the steering wheel for too much play.
   b) Look for uneven tire wear.
   c) Push down on the bumper and see if the car continues to bounce more than twice.
   d) See if you are getting fewer miles per gallon of gas.

8. To check your brake system, you do not have to:

   a) Put the car up on a lift and shake the wheels.
   b) Look for fluid leakage near the master cylinder and the wheels.
   c) Check the master cylinder brake fluid level.
   d) Test the brake pedal to see if it sinks down after you take your foot off.

9. If you are carrying packages or other materials inside your car, you should:

   a) Make sure nothing is in the front seat.
   b) Check that their weight does not exceed 200 pounds.
   c) Be sure you can see out of all of the windows.
   d) Place padding on everything carried in the passenger area.

10. When operating a motor vehicle, you must always carry your:

   a) Proof of insurance.
   b) Proof of age.
   c) Ownership title or certificate.
   d) Driver's license.

ANSWERS TO UNIT 8 KNOWLEDGE TEST

1. (d) When a car is disabled and cannot be removed from the roadway at night, the flares should be placed at least 200 yards behind the car. That's a long distance, two football fields to be exact. However, at high speeds, it could conceivably take that long for another driver to react and bring his car to a stop.

2. (b) When you are using jumper cables to start a car with a dead battery, the positive terminal of one battery should be connected to the positive terminal of the other battery. You should also attach one end of the second jumper cable to the negative terminal of the booster battery and the other end to the engine block of the car with the dead battery. When connecting the jumper cables, the ignition should be turned off in both cars. But after the correct connections have been made, and the starter of the car with the discharged battery has been engaged, it is a good idea to start the engine of the booster car if the other car does not start immediately. This will prevent the good battery from being drained excessively.

3. (a) When the temperature gauge of your car shows that the engine is starting to overheat, you should turn off the air conditioner and turn on the car heater. By turning off the air conditioner, you reduce the load on the engine, and by turning on the heater you obtain additional cooling surface for the water circulating in the engine. When you have pulled your car off the roadway, then put the car in neutral and race the engine slightly. This will cause the fan to turn faster and aid in cooling the engine.

4. (c) You have had a flat tire and have pulled your car completely off the roadway onto a level area of the shoulder. Before jacking up the car, you should put the car in park, apply the parking brake, and block the wheel that is diagonally across from the flat tire. Once you have done these things, you have taken reasonable precautions against the car rolling or falling while you change the flat tire. It is a good idea to carry a piece of lumber about a foot long to use as a block. Blocking the wheel diagonally across from the flat tire is safest because that is the wheel bearing the most weight.

5. (b) If you have a breakdown at night on a freeway, you should pull off the road, turn on your four-way flashers, and wait for help. Use of the parking lights is dangerous; a car approaching from behind may mistake them for normal taillights and start to "follow" you. Leaving the car to flag down another car or seek help is potentially dangerous. Since freeways are regularly patrolled, it is best to wait for help.

6. (b) Because you were distracted momentarily, you accidently strike a car ahead of you that has stopped suddenly. You should provide the driver only with your name, address, license and registration numbers, and the name of your insurance company. You are not obliged to provide witnesses and you should never volunteer your opinion as to whose "fault" it is. First, it may take a judge or a jury to decide who is at fault. Secondly, you can lose your insurance policy and place yourself in legal difficulty. However, there is nothing wrong with giving the other driver the name of your insurance company, and you may ask for the name of his, too. You are not obliged to make an on-the-spot settlement of damages.

7. (d) When checking for steering or suspension problems, it will not help to see if you are getting fewer miles per gallon of gas. The other three alternatives will, however, provide clues about whether your steering and suspension systems need attention. If the steering wheel has to be turned several inches before the wheels move, then adjustments are necessary. Uneven tire wear may be an indication of any number of steering and suspension difficulties, such as the front end being out of alignment. Pushing down on the bumper and checking for the number of bounces is a test to determine if the car needs new shock absorbers.

8. (a) To check your brake system, you do not have to put the car up on a lift and shake the wheels. Loose wheels are related to the steering and suspension systems rather than the braking system. However, the fluid in the master cylinder is vital to the proper functioning of the brakes. If there is a leak, causing the fluid level to drop, your brakes need attention immediately. A brake pedal that does not work properly is also a symptom of a hydraulic leak.

9. (c) If you are carrying packages or other materials inside your car, you should be sure you can see out of all the windows. As you have learned in previous LAPs, unobstructed vision is essential to safe driving.

10. (d) When operating a motor vehicle, you must always carry your driver's license. This is your proof that you have passed the legal requirements needed to drive in your state. If a police officer asks to see your license, you must show it to him. It is not necessary to carry evidence that you have insurance or evidence of ownership. If you have a driver's license, you are obviously old enough to drive.

UNIT 8

KNOWLEDGE TEST

ITEM	SOURCE	CRITICALITY RATING[*]
1.	Fall '73, Test #1	MC
2.	Fall '73, Test #3 (modified)	MLC
3.	Fall '73, Test #4 (modified)	MLC
4.	Fall '73, Test #5 (modified)	MC-MLC
5.	Fall '73, Test #6 (modified)	MC
6.	Fall '73, Test #8 (modified)	MLC
7.	HSRI #706	MC
8.	HSRI #707	MC
9.	HSRI #62	MC
10.	HSRI #772	MHC

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[*] The criticality rating of the related driver task (HC = High Criticality; MHC = Moderately High Criticality; MC = Moderate Criticality; MLC = Moderately Low Criticality).

Analysis of Variance for Unit Test Results, by Achievement Level and Sex

Source	*df*	*MS*	*F*
Unit 3			
Sex	1	3.97	1.17
Level	1	122.72	29.60**
Sex X Level	1	2.84	<1
Error (Within Cell)	223	4.15	
Unit 4			
Sex	1	2.30	<1
Level	1	96.36	28.51**
Sex X Level	1	5.64	1.67
Error (Within Cell)	217	3.38	
Unit 6			
Sex	1	8.69	2.97
Level	1	34.69	11.86**
Sex X Level	1	1.27	<1
Error (Within Cell)	190	2.92	
Unit 7			
Sex	1	4.77	1.42
Level	1	30.20	8.96**
Sex X Level	1	28.39	8.44**
Error (Within Cell)	186	3.36	
Unit 8			
Sex	1	3.77	1.60
Level	1	66.80	28.27**
Sex X Level	1	2.43	1.03
Error (Within Cell)	184	2.36	

**Indicates statistical significance, $p < .01$.

Appendix C

PERCEPTUAL SKILLS TEST

Unit 5, 7th of 7 classroom sessions

Instructional Materials Needed in Class

1. Film: "Perceptual Skills Test"
2. Student answer sheets, Perceptual Skills Test.
3. LAP 7-2, one copy per student.

CONTENT	SUGGESTED TIME	INSTRUCTIONS
1. Roll		Take roll and confirm what session students are attending--Safe Driver Course, Class Session #20.
2. Perceptual Skills Test	15 - 20	Instructor should preview film, "Perceptual Skills Test," prior to the classroom session. There is no manufacturer's instructor guide for the film, since it is a combination of segments from various films. Instructions for each film segment are provided on pages 36 through 39. (Instructor cards provide the same information.) General Instructions --Sound should be turned off during film, since the sound track is not appropriate for Unit 5 objectives. --Instructor should cue students in at the beginning of each segment. (See "Cue to students" under instructions for each segment.)

CONTENT	SUGGESTED TIME	INSTRUCTIONS
		--At critical points throughout the film, blank segments have been inserted as a cue to the instructor to stop the projector and raise a question (e.g., is it safe to pass now?). Questions are provided under instructions for each segment. --After the blank segment, the completion of the situation is shown on the film. During the test itself, the instructor should cover the lens with a card, so that the correct answer is not projected. During the discussion of the film, and after answer sheets have been collected, the entire segment should be shown. --Students respond by marking their answer sheets with "A" for "safe," or "B" for "unsafe." Test Administration Distribute student answer sheets for "Perceptual Skills Test." Explain to students that at critical points throughout the film, you will stop the projector and ask them a question. They should respond by checking their answer sheets. Instructor cards describing cues for each film segment are provided to facilitate test administration. Information provided on cards matches instructions given on pages 164 through 168.

Unit 5, 7th of 7 classroom sessions (Cont'd)

CONTENT	SUGGESTED TIME	INSTRUCTIONS
3. Discussion of "Perceptual Skills" film.	30 - 35	Discussion of Film After students have responded to the ten situations presented in the film, collect answer sheets. Then, re-run the film and have students discuss each situation, explaining how they responded and providing a rationale for their choice. (For discussion purposes, back up and re-run segments, if necessary.) If time permits, use film for group commentary driving. Have students "speak out" hazards, events, etc... and how they would respond. Students should tell the instructor to stop the projector when they find potential hazards.
4. Assignment		Assign LAP 7-2 and inform students that they will be tested on this material on Day 62 of the course. Briefly review LAP exercises and ensure that students understand them. Next class--Multimedia presentation for Unit 6. (Students should have read LAP 6-1 and finished exercises by the next class session.)

Materials Instructor Needs by End of Class

1. Student answer sheets, Perceptual Skills Test.

PERCEPTUAL
SKILLS TEST

INSTRUCTOR GUIDANCE: "Perceptual Skills" film.

(Information to accompany each segment of "Perceptual Skills" is given below.)

SEGMENT ONE

Cue to students: You should be paying close attention to this segment to decide whether it's safe to pass at the point when I stop the projector.

Blank (STOP projector): Is it safe to pass here? Answer "A" if it's SAFE: "B" if it's NOT SAFE.

Correct response: (A) Yes, it's safe to pass here. We've got a clear path in the oncoming lane.

(Remainder of segment shows completion of passing maneuver.)

SEGMENT TWO

Cue to students (after pass is completed): You'll be asked to make another passing decision when I stop the projector.

Blank (STOP projector): Is it safe to pass here? Answer "A" if it's SAFE; "B" if it's NOT SAFE.

Correct response: (B) No, we shouldn't pass until we're beyond the yellow line.

(Remainder of segment shows completion of pass.)

SEGMENT THREE

Cue to students (on dirt road): This is a different situation. It has nothing to do with passing. Let's see if you can figure out what the problem is.

Blank (STOP projector): Answer "A" if you'd SLOW DOWN HERE AND PREPARE TO STOP; answer "B" if you'd MAINTAIN SPEED.

Correct response: (A) Slow down, because of the car coming out of the driveway on the right. What factors enter into this situation? (Discuss the differences in stopping ability on this gravel road vs. dry pavement; the point at which you should have begun braking, etc...)

(Remainder of segment shows car stopping suddenly and then proceeding up hill.)

SEGMENT FOUR

Cue to students (on expressway): You'll be asked a question about following distance when I stop the projector.

Blank (STOP projector): Are you at a safe following distance now? Answer "A" if it's SAFE; "B" if it's NOT SAFE.

Correct response: (B) No, this is not a safe following distance. Why? Because the large truck has pulled in front of us. In addition, we're likely to be travelling pretty fast on this expressway.

(Remainder of segment shows truck pulling into another lane.)

SEGMENT FIVE

Cue to students (after truck pulls into other lane): You'll be approaching and stopping at an intersection. Decide whether it's safe to cross when I stop the projector.

Blank (STOP projector): Is it safe to cross the intersection now? Answer "A" if it's SAFE; "B" if it's NOT SAFE.

Correct response: (B) No, it's not safe to cross the intersection now. Why? Must wait for the red car across the street to move out of our path.

(Remainder of segment shows car waiting, then proceeding across intersection.)

SEGMENT SIX

Cue to students (after car from last segment crosses intersection): You'll be approaching another intersection. Decide whether it's safe to cross when I stop the projector.

Blank (STOP projector): Is it safe to cross now? Answer "A" if it's SAFE TO CROSS; "B" it it's NOT SAFE TO CROSS THE INTERSECTION.

Correct response: (B) No, it's not safe to cross now. Why? We should wait for the white car and check left again before crossing the intersection.

(Remainder of segment shows driver waiting for white car, checking left again, and then crossing the intersection.)

SEGMENT SEVEN

Cue to students (after car from last segment crosses intersection): You'll be approaching and stopping at another intersection. Decide whether it's safe to turn right when I stop the projector.

Blank (STOP projector): It is safe to turn right now? Answer "A" if it's SAFE; "B" if it's NOT SAFE.

Correct response: (A) Yes, the gap is sufficient to turn right.

(Remainder of segment shows car completing the right turn, proceeding up the street and preparing for a left turn.)

SEGMENT EIGHT

Cue to students (as car prepares for left turn by moving into left-hand lane): Decide whether it's safe to turn left when I stop the projector.

Blank (STOP projector): Is it safe to turn left now? Answer "A" if it's SAFE; "B" if it's NOT SAFE.

Correct response: (A) Yes, the gap is sufficient to turn left.

(Remainder of segment shows car completing left turn.)

SEGMENT NINE

Cue to students (after car from last segment turns left): Prepare to turn left again at the next intersection.

Blank (STOP projector): Is it safe to turn left now? Answer "A" if it's SAFE; "B" if it's NOT SAFE.

Correct response: (B) No, it's not safe. Why? The gap between vehicles is sufficient, but the pedestrian is about to cross the street in your path of travel.

(Remainder of segment shows car waiting for pedestrian and sufficient gap, completing turn, and proceeding up the roadway.)

SEGMENT TEN

Cue to students (as car from last segment is proceeding up the street): You'll be asked to make a passing judgment when I stop the projector.

Blank (STOP projector): Should the driver in the red car complete his pass now? Answer "A" if he should COMPLETE THE PASS; "B" if he SHOULD NOT COMPLETE THE PASS.

Correct response: (B) He shouldn't complete the pass. Why? The car in front of him is weaving. What should he do? He should drop back and wait until the car in front of him is stabilized in the lane.

Appendix D

BASIC SKILLS RANGE TEST

Sample Data Sheet

Equipment Checklist

Range Test

EQUIPMENT CHECK LIST

RANGE TEST

An instructor or an instructor aide should see that the conditions listed below are met well before the start of each range test.

_____ Pillows, brake and accelerator extensions in car

_____ Car trunks empty of cones, flags and other range equipment

_____ Cones and flags arranged appropriately on the range

_____ Car radio turned off

_____ Range test forms available

_____ Communications equipment operable

SAMPLE DATA SHEET *

BASIC SKILLS RANGE TEST

STUDENT CONTROL NUMBER ______________________________

TEST CODE NUMBER ________

STUDENT NAME ____________________ / ____________________ ________
Last First M.I.

TEST DATE _____/_____/_____
month day year

TEST SITE ______________________________

WEATHER CONDITIONS
_____ Dry and sunny
_____ Wet and sunny
_____ Dry and overcast
_____ Wet and overcast
_____ Downpour (low visibility)

TIME OF DAY
_____ AM
_____ PM

* Attach to each test.

RANGE TEST

UNIT 2 - BASIC CONTROL TASKS

PURPOSE:* The purpose of this range lesson is to test student performance on control of the car, turns, and lane changes.

GENERAL METHODS: Observe and record the response to each task on the test. Indicate "yes" (if the student performed the procedure) or "no" (if he didn't) for each test item. One-half of the A or B group per period (8 students) will be tested. The test administration requires four (4) cars with one student per car. Using the range diagram for each school, instructor should brief all eight students on the test sequence before any tests are conducted. When all testing is completed, all students should be informed of their performance. Four students will observe while the other four are being tested. Then the observers are tested. Three instructors are required to administer the test. One instructor provides all directions and communications to the students. The other two instructors rate and record the students' performance in all test areas. This test is not designed to be all-inclusive of basic control driving. All steps or procedures for a task are not evaluated. Those steps or procedures thought to be critical (most related to safety), however, are included on the test. Rate the student for a task (e.g., accelerating/stopping) only when that task is being administered as a test item. Rate only those items covered on the test. (Evaluation forms are on pages 6 through 8.)

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* Refer to the performance objectives in the Appendix to Unit 2. (Instructor should familiarize himself with these objectives prior to the range lesson.)

This test is one of five evaluation measures used throughout the course to test curriculum effectiveness. It can be used, however, for assigning course grades to students (SPC/PDL).

Fill in student Progress Chart during change of drivers.

EQUIPMENT NEEDS:

One yard stick

Cones and flags

Communication equipment

Clipboards for raters

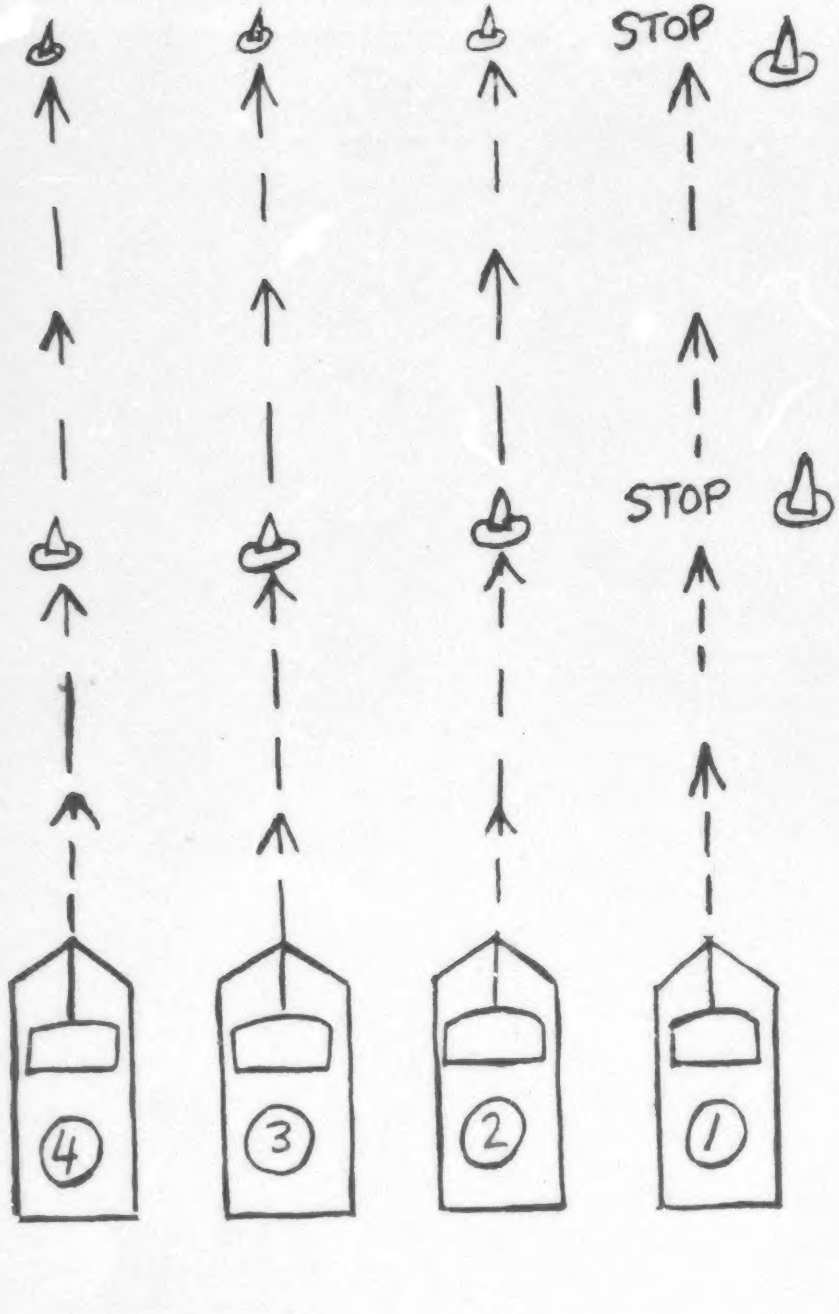
Watch with second-hand

RANGE TEST
UNIT 2 - BASIC CONTROL TASKS (Continued)

CONTENT/SEQUENCE FOR ADMINISTRATION	METHOD
1. Prestart/Starting	1. Four vehicles (one student per car) in a line side by side. One instructor gives command to go through prestart/starting of the vehicles. The other two instructors each observe and rate two students each. (This setup is similar to the first range lesson.)
2. Accelerating/Stopping	2. Four vehicles (one student per car) in a line side by side. One instructor gives command to move forward and stop as near as possible at a traffic cone and flag without striking it. Two lines of cones (four to a line) should be placed on range so the students will move and stop two times. Place first line half way down the range and second line near the end of range. When they reach the first line of cones, repeat the command. The other two instructors each observe and rate one student at a time. (See Range Layout shown on page 5.)
3. Maintains Lane	3. Upon completion of the accelerating/stopping test item, all four vehicles will be at the end of the range. One instructor gives command to make left turns and drive around the range in a follow-the-leader fashion, until told to stop. The other two instructors observe and rate each student only on directional control. Each rater evaluates two students. Make observations on the straightaway area of the range. The first vehicle driver in line is rated on the first straightaway; the second on the other side of the range or second straightaway, and so on. Two complete trips around the range should allow for all observations. Stop all vehicles.
4. Turning Left	4. Upon completion of "Maintains Direction" test item, all four vehicles should be in position for a left turn. One instructor gives command to move forward and make left turns until directed to stop. The other two instructors observe and rate each student on left turns. Each rater

CONTENT-SEQUENCE FOR ADMINISTRATION	METHOD
	evaluates two students. The first vehicle driver in a line is evaluated on the first turn, the second on the next or second turn, and so on. One and one-half trips around the range should allow for all observations. Stop all vehicles.
5. Turning Right	5. One instructor gives command for all four drivers to move forward, turn left at the first cross street, and turn right upon reaching the other side of the range. The other two instructors observe and rate each student on right turns. Each rater evaluates two students. The first vehicle driver in a line is evaluated on the first turn, the second on the next or second turn, and so on. One and one-half trips around the range should allow for all observations. Stop all vehicles.
6 & 7. Lane Change Left/Right	6 & 7. One instructor gives directions. Second instructor checks right lane change, and third instructor checks left lane change. Each student is checked twice for each lane change (left and right). Eight to twelve trips around the range should complete the testing for items 6 and 7. Students are merely directed to make lane change (left or right) on each side of the range at a minimum of 10 mph. (See Layout in SR2.). Students must make lane change within 90 feet. Raters must measure check-points.

RANGE TEST



BASIC CONTROL RANGE TEST

EVALUATION FORM

SCORING:

Check:
Yes: - if correct
No: - if incorrect

NAMES:

Evaluators ______________________________

____

Student ____________________ # ________

1. PRESTART/START

	Yes	No
Locks doors	___	___
Adjusts/checks seat	___	___
Adjusts/checks inside mirror	___	___
Adjusts/checks outside mirror	___	___
Fastens belts	___	___
Applies brake while starting (observe brake lights)	___	___
Starts car without difficulty (delay)	___	___

2. ACCELERATING/STOPPING

	Yes	No
Selects "D" gear without difficulty (delay)	___	___
Acceleration is smooth	___	___
Begins to brake at right time (observe brake lights)	___	___
Maintains foot pressure on brake while stopped	___	___
Stops at cone (within 24 inches)	___	___
Avoids striking cone	___	___

3. MAINTAINS DIRECTION

	Yes	No
Places hands on upper half of steering wheel	___	___
Centers car in lane	___	___
Drives without "weaving"	___	___

4. TURN LEFT

	Yes	No
Signals for turn at correct distance	___	___
Adjusts speed before starting turn (observe vehicle slowing or brake lights)	___	___
Accelerates slightly in turn	___	___
Uses hand-over-hand steering	___	___
Maintains lane while in turn	___	___
Enters proper lane to complete turn	___	___
Overall speed was correct for turn	___	___

5. RIGHT TURN

	Yes	No
Signals for turn at correct distance	___	___
Adjusts speed before starting turn (observe vehicle slowing or brake lights)	___	___
Accelerates slightly in turn	___	___
Uses hand-over-hand steering	___	___
Maintains lane while in turn	___	___
Enters proper lane to complete turn	___	___
Overall speed was correct for turn	___	___

6. LANE CHANGE LEFT

	Yes	No
Signals	___	___
Head Check (90° angle)	___	___
Uses correct speed (constant or slight increase)	___	___
Cancels signal	___	___
Positions car in lane	___	___
Completes lane change before adjusting for turn	___	___

7. LANE CHANGE RIGHT

	Yes	No
Signals	___	___
Head Check (90° angle)	___	___
Uses correct speed (constant or slight increase)	___	___
Cancels signal	___	___
Positions car in lane	___	___
Completes lane change before adjusting for turn	___	___

IF THE STUDENT WAS UNABLE TO PERFORM (TOTAL LACK OF PERFORMANCE) ANY OF THE TEST ITEMS, CHECK BELOW:

1. Prestart/Start ____
2. Accelerating/Stopping ____
3. Maintains Direction ____
4. Turning Left ____
5. Turning Right ____
6. Lane Change Left ____
7. Lane Change Right ____

Appendix E

EVASIVE RANGE TEST

RANGE TEST

EQUIPMENT CHECK LIST

An instructor or an instructor aide should see that the conditions listed below are met well before the start of each range test.

_____ Pillows, brake and accelerator extensions in car

_____ Car trunks empty of cones, flags and other range equipment

_____ Cones and flags arranged appropriately on the range

_____ Car radio turned off

_____ Range test forms available

_____ Communications equipment operable

Unit 7, 4th range session: **"Culminating Test for Evasive Maneuvers Set"**

PURPOSE: The purpose of this range session is to test the student's ability to apply the proper procedures in the following maneuvers: (1) serpentine; (2) blocked lane; and (3) controlled braking.

INSTRUCTORS NEEDED: 4 instructors and 2-3 instructor aides.

NUMBER OF STUDENTS/VEHICLES: 12 students and 4 vehicles. (Three students to a car: one student drives; two students ride belted in rear seat.

RANGE LAYOUT: See Unit 7 range lessons--SR10, SR11, and SR12. Layout will be the same as for those lessons, except that for test purposes, lane widths for approach and outrun in serpentine should be reduced to 10 feet and lane widths in evasive left/right (SR11) and controlled braking (SR12) should be reduced to 9 feet.

METHODS: Each instructor will take three students through the test course (4 instructors--4 cars--12 students). Any additional students should be monitored by the instructor aide, until an instructor is free to administer the test to them. Two or three aides are needed for resetting cones on the test course. As first car completes serpentine course, aide will reset cones and second car will run through serpentine course. First car proceeds to blocked lane course, aide resets cones there, second car runs through blocked-lane course while instructor aide resets cones on serpentine. Third car proceeds through serpentine, and so forth. Each student driver runs through entire test course twice.

SCORING OF TEST: Scores will be derived from a composite of the cones knocked over in each maneuver. In addition, a student receives an "I" (Inferior) for a "wrong direction" on the blocked lane exercise. The "boxed-in" cones on the range diagrams (pages 6, 7, and 8 are those cones which should be scored. Cones not in the "boxed-in" areas, that is, most of the cones in the approach and outrun, are not scored. Scoring is as follows for each maneuver (Score Sheet is on page 9):

0 cones displaced = E (Excellent)
1 cone displaced = S (Superior)
2 cones displaced = M (Medium)
3 cones displaced = I (Inferior)
Wrong Direction on Blocked Lane = I (Inferior)
4 (or more) cones displaced = F (Fail)
Could Not Perform (CNP) = F (Fail)

DEFINITION OF CNP

For the Serpentine Maneuver, the instructor would mark the student CNP if he: (1) leaves the exercise; (2) goes straight, i.e., fails to steer around a cone in the serpentine; (3) brakes; (4) does not maintain a speed of 25 mph; or (5) doesn't use the 9 - 3 hand position.

For the Blocked Lane maneuver, the instructor would mark the student CNP if he: (1) leaves the exercise; (2) goes straight, i.e., does not evade the barrier; (3) brakes; or (4) does not maintain a speed of 25 mph.

For the Controlled Braking maneuver, the instructor would mark the student CNP if he: (1) leaves the exercise; (2) goes straight, i.e., does not evade the first or second barrier; (3) locks the brakes; (4) does not maintain a speed of 25 mph; or (5) brakes too soon, i.e. before he has evaded the first barrier.

TABULATING SCORES

Each maneuver is scored twice. By assigning a point value to the letter grades, a total (or average) score may be derived for each maneuver by adding the scores for the first and second runs and dividing by two. Point values are as follows:

E = 5
S = 4
M = 3
I = 2
F = 1

Then, a total test score is derived by adding the three scores for all maneuvers and dividing by three.

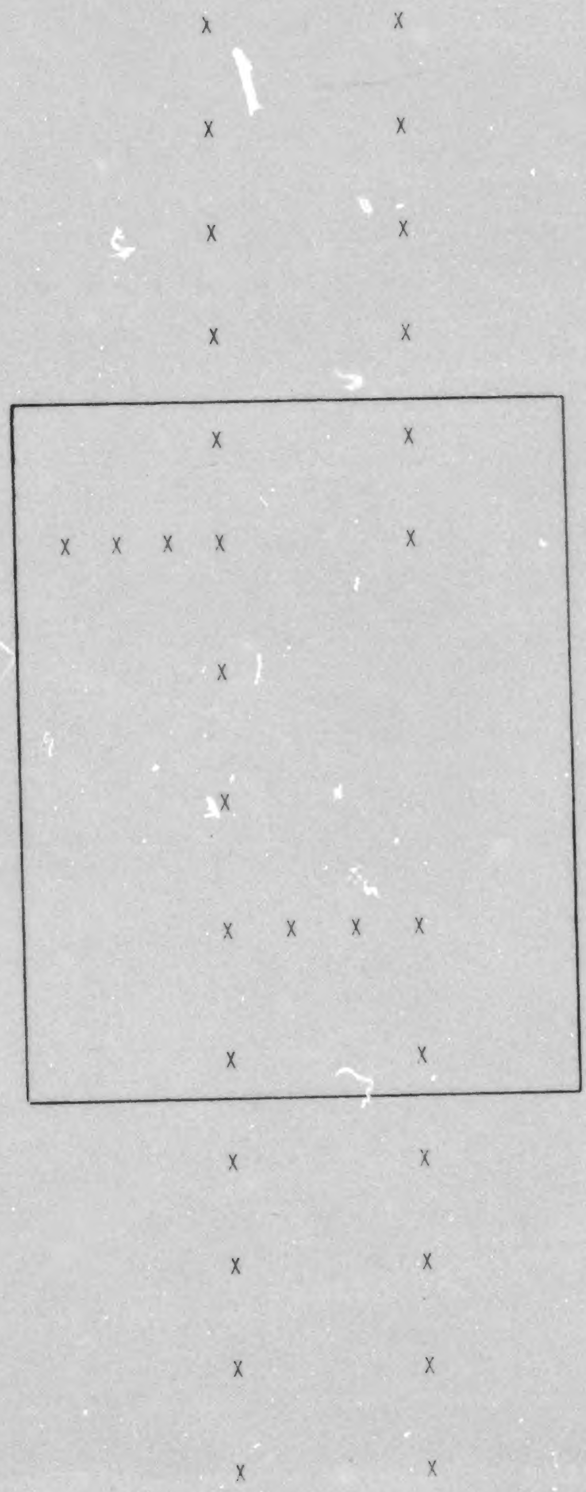
Example: A student scores "I" (or 2 points) on the first run of the serpentine, and an "S" (or 4 points) on the second run. (So, $2 + 4 = 6 \div 2 = 3$ = "M".) Now, let's say the student also scores an "M" (3 points) on the blocked lane exercise, and an "F" (1 point) on the controlled braking exercise. (So, $3 + 3 + 1 = 7 \div 3 = 2.3$ or "I" for a total test score.)

INSTRUCTION

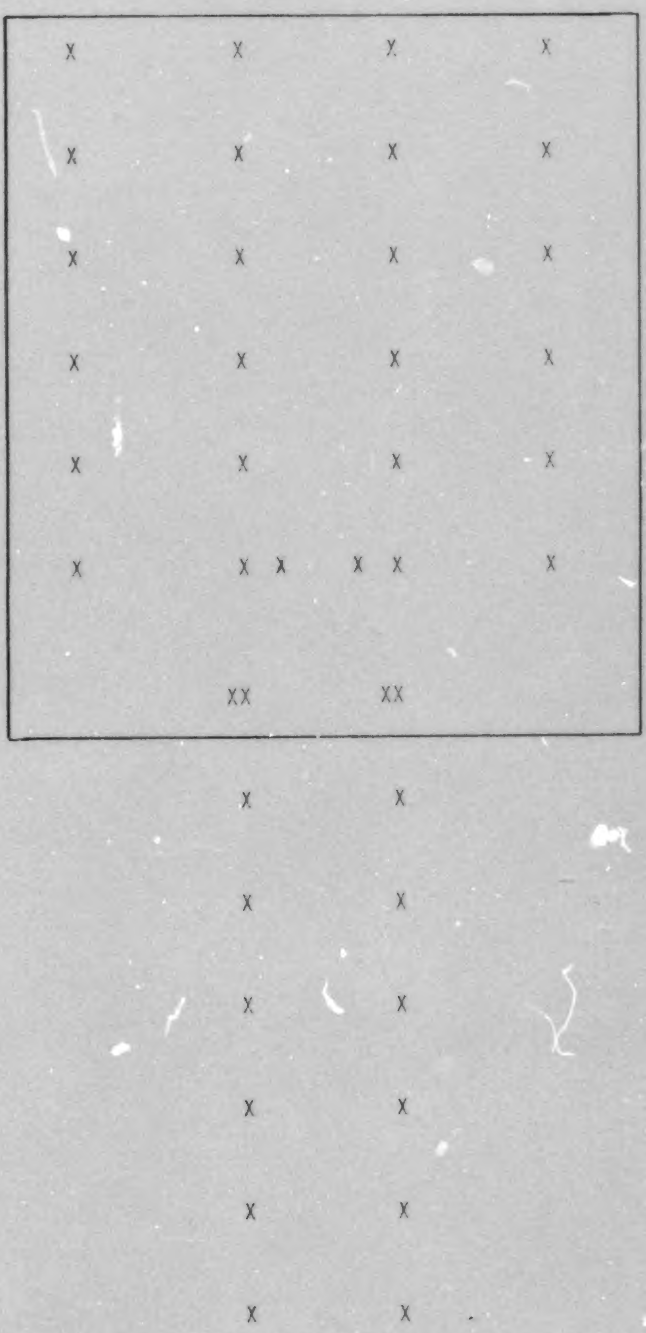
SEQUENCE	TIME	TECHNIQUES
1. Explanation: Students gather adjacent to test course for explanation.	5 minutes	1. An instructor should explain the test course and scoring to students. Tell students that the test will be run at 25 mph and that they will be scored twice for each maneuver.
2. Students enter cars staged at serpentine area (4 cars--3 students to a car; instructor in each car to monitor speed and score test).	3 minutes	2. Check seat adjustment and restraint devices. Ensure that students understand instructions.
3. Serpentine at 25 mph.	1 hour	3. Instructor monitors speed and marks score sheet for first student driver. When student has completed course, the instructor should check with the instructor aide for an accurate determination of cones knocked over. Aide resets cones on serpentine course and second car proceeds through course.
4. Blocked lane at 25 mph.		4. Instructor monitors speed, tells the driver when to evade and direction to evade, and marks score sheet for driver. Again, the instructor checks with the instructor aide to obtain an accurate count for number of cones knocked over.

SEQUENCE	TIME	TECHNIQUES
		Aide resets cones on blocked lane course; second car proceeds through course. Aide resets cones on serpentine course; third car proceeds through serpentine.
5. Controlled braking at 25 mph.		5. Instructor monitors speed and gives cue to driver ("now"), which means that the driver should evade the first barrier, then brake and steer to evade the second barrier, and come to a complete stop within the 18' provided in the center lane. Mark score sheet.
		Check with instructor aide to obtain an accurate count for number of cones knocked over.
		Aide resets cones on controlled braking course, second car proceeds through course. Aide resets cones on blocked lane course, third car proceeds through course. Cones are reset on serpentine and fourth car runs through serpentine.
		Note: First driver in first car has now completed first run through entire course. He now begins his second run through the course. He is scored on both runs. This sequence is used until all three drivers in the four cars have run through the test course twice.

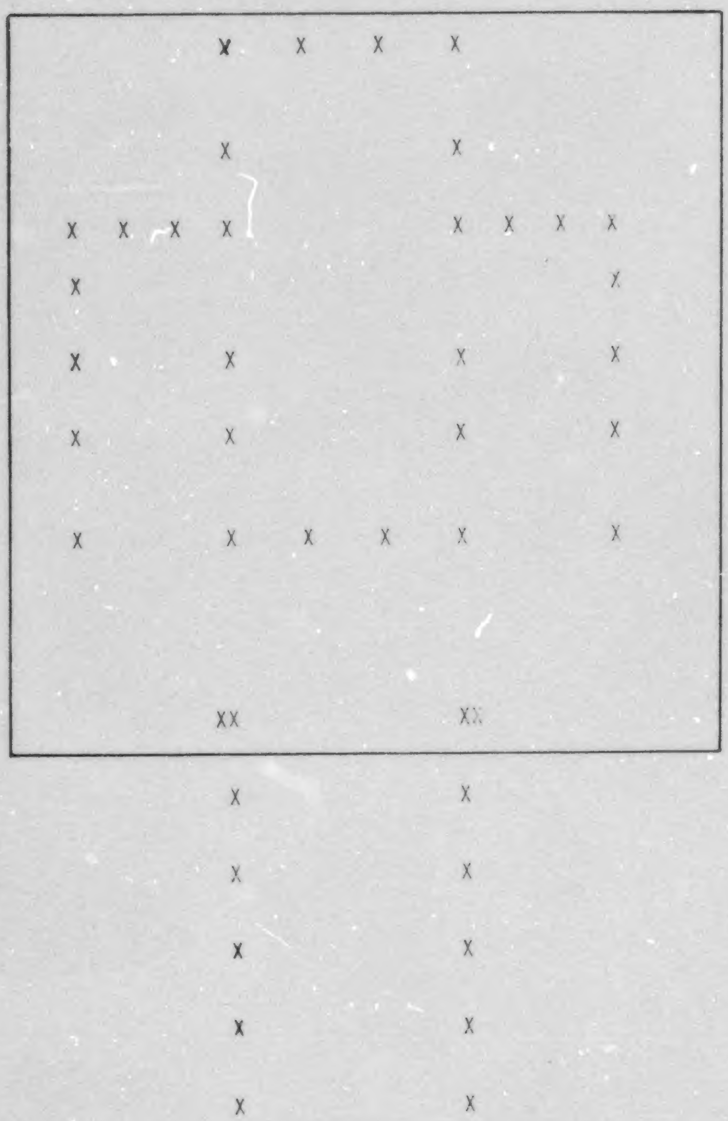
SERPENTINE



BLOCKED LANE



CONTROLLED BRAKING



Total Test Score = ___

SCORE SHEET

EVASIVE RANGE TEST

Student Name: ___
Student Group #: ___
School: ___
Rater's Name: ___
Weather Conditions: ___
Time: ___
Test Site: ___

(Instructions: See "Scoring of Test," page 1, for specific directions.)

SERPENTINE
(First Run)

Number of Cones Displaced = ___
Check (if applicable):
CNP
- ___ Leaves exercise
- ___ Goes straight (doesn't steer around cone)
- ___ Brakes
- ___ Speed under 25 mph
- ___ Hands not at 9-3

(Score = ___)

BLOCKED LANE
(First Run)

Number of Cones Displaced = ___
Check (if applicable):
- ___ Wrong Direction

CNP
- ___ Leaves exercise
- ___ Goes straight (through barrier)
- ___ Brakes
- ___ Speed under 25 mph

(Score = ___)

CONTROLLED BRAKING
(First Run)

Number of Cones Displaced = ___
Check (if applicable):
CNP
- ___ Leaves exercise
- ___ Goes straight (doesn't evade 1st or 2nd barrier)
- ___ Brakes too soon
- ___ Locks brakes
- ___ Speed under 25 mph

(Score = ___)

SERPENTINE
(Second Run)

Number of Cones Displaced = ___
Check (if applicable):
CNP
- ___ Leaves exercise
- ___ Goes straight (doesn't steer around cone)
- ___ Brakes
- ___ Speed under 25 mph
- ___ Hands not at 9-3

(Score = ___)

Total Score for both runs = ___

BLOCKED LANE
(Second Run)

Number of Cones Displaced = ___
Check (if applicable):
- ___ Wrong Direction

CNP
- ___ Leaves exercise
- ___ Goes straight (through barrier)
- ___ Brakes
- ___ Speed under 25 mph

(Score = ___)

Total Score for both runs = ___

CONTROLLED BRAKING
(Second Run)

Number of Cones Displaced = ___
Check (if applicable):
CNP
- ___ Leaves exercise
- ___ Goes straight (doesn't evade 1st or 2nd barrier)
- ___ Brakes too soon
- ___ Locks brakes
- ___ Speed under 25 mph

(Score = ___)

Total Score for both runs = ___

App[illegible]

ON-ROAD PERF[illegible]E TEST

Sample Data Sheet

Equipment Checklist

Administrator's Guide

SAMPLE DATA SHEET[1]

ON-ROAD PERFORMANCE TEST

STUDENT CONTROL NUMBER ____________________________________

TEST CODE NUMBER __________

STUDENT NAME ______________________ / ____________________ ____
Last First M.I.

TEST DATE _____/_____/_____
month day year

TEST SITE ____

ROUTE __________ Inbound

__________ Outbound

WEATHER CONDITIONS _____ Dry and sunny

_____ Wet and sunny

_____ Dry and overcast

_____ Wet and overcast

_____ Downpour (low visibility)

RATERS CODE NUMBER ________ (If there is more than one rater, each rater is assigned a number. Enter here)

TIME OF DAY _____ AM

_____ PM

TRAFFIC DENSITY _____ Heavy

_____ Moderate

_____ Light

---

[1] Attach to each test.

EQUIPMENT CHECKLIST

ON-ROAD PERFORMANCE TEST

An instructor or an instructor aide should see that the conditions listed below are met well before the start of each on-road performance test.

_____ Car has sufficient gas

_____ Car top sign affixed

_____ Pillows, brake and accelerator extensions in car

_____ First aid kit and flares in car

_____ Trunk empty of cones and other range equipment

_____ Car radio turned off

_____ Mirrors checked (rear, side, and instructor eye-check mirrors)

_____ Inbound and outbound test booklets

ON-ROAD PERFORMANCE TEST

ADMINISTRATOR'S GUIDE

Pre-Selection of Students

Safety considerations dictate that the instructor determine the proficiency level of students prior to on-street testing.[1]

Administrator's Guide

The Administrator's Guide on the following pages is intended to assist administrators or raters of the On-Road Performance Test. For each performance check, the guide identifies the following:

1. The most appropriate situation in which to administer the performance check, as an aid to route selection;
2. The meaning of each performance check response category, as an aid to recording the examinee's responses.

The situations in which each performance check is carried out will vary too widely to permit highly detailed guidance on the use of response categories. Rather, the guide provides general principles related to test administration and attempts to define the manner in which the judgments of a competent administrator may be recorded.

The performances described within this guide are intended to provide an overview of the checks which may be made when the administrator is confronted with a particular situation (e.g., Left Turn with Oncoming Traffic) during the course of the test.

---

[1] Although the instructor's judgment of student ability should be the overriding consideration in selection, experience in the Kansas City pilot test administration of the test indicated that students having three exposures to the range and two exposures to on-street instruction could perform adequately on the test. Less than two percent of the tests (n = 333) were aborted due to student inability to perform.

For each maneuver, the following format is used:

Maneuver[1] ______________________________ Item #[2] ______________

Cue Student[3] ____

Scoring Interval[4] ____

SCORE

Var. No.	Variable Name	P	F	n/a
1.0	Path			
1.1	Position . . .			
2.0	Speed.			
3.0	Signaling. . . .			
4.0	Observing. . . .			
5.0	Traffic Control.			
6.0	Task			

Rater's Comments:

---

[1] A list of all maneuvers included in the On-Road Performance Test appears on page 198.

[2] Items are numbered in the sequence in which they occur (e.g., Item #1 is Pre-Op, Item #2 may be Left Turn, depending on the route, the last item would always be Shut-Down). The number of maneuvers for a specific route will vary, depending on the time allotted for the test and the maneuver potential available on the test route. In the Kansas City pilot administration of the test, each student was rated on approximately 35 maneuvers (25 - 30 minutes driving time per student). Note: Test administration in the pilot test took place within a one-hour session, during which two students were tested. The first student drove the "outbound" route, which ended approximately 25 minutes away from the test site; the second student drove the "inbound" segment, which ended back at the site.

[3] Information given here will tell the test administrator where to cue the student and what to tell the student, e.g., At the fire hydrant on Smith Street *(direction to instructor)*, "Turn right at the next street" *(cue to student)*.

[4] The scoring interval defines the area in which the rater scores the driver. Scoring intervals are included in the definitions for each of the maneuvers.

Definitions for each of these variables and for "Pass," "Fail," and "Not Applicable" are described in general terms below. Then, beginning on page 199, checks are broken out by situations or maneuvers.

DEFINITIONS FOR MANEUVER VARIABLES[1]

Pass - A student's performance on a task or element of a task that the rater judges as safely executed.

Fail - A student's performance on a task or element of a task that the rater judges as not minimally skillful, or not safely executed. (Further defined in "Definitions for Maneuver Checks.")

Not Applicable - A task or task element listed on the test score sheet that could not be scored either Pass or Fail because (1) the task was interrupted by responding to an emergency or hazard; (2) a task, by definition, did not contain a given scoreable task element (would not occur if the test format were made "route specific," i.e., those variables which do not apply to a specific maneuver are deleted prior to test administration); or (3) the conditions requiring student response did not occur; e.g., the student could not respond to parked cars or pedestrians because none were in the area which was programmed for these maneuvers.

Not Scoreable - Pertains only to observing, where the rater has no reasonable, direct evidence that the student was or was not actually observing when required by the driving task being scored. (Use N/A block and mark "N/S")

Path - The ground path, lateral and longitudinal, taken by the vehicle through a period of time. This includes forward and backward motion and turns. Gap acceptance is also scored under "Path." If a student does not enter an acceptable gap in the course of a maneuver (e.g., left turn with oncoming traffic), or enters an unsafe gap, the student fails "Path."

Position - The lateral and longitudinal location of the vehicle when it is stopped (e.g., at a STOP sign, the car's front should not extend into the intersection and the car should not extend into an adjacent lane). Position should only be scored when the vehicle is at a stop.

Path and Position would both be scored during a single maneuver if the driver were required to stop during the task, e.g., Left Turn with Oncoming Traffic.

---

[1] Further defined for specific maneuvers on pages 199 through 211.

DEFINITIONS FOR MANEUVER VARIABLES (Continued)

Speed - The value indicated by the car's speedometer throughout the scoring interval. In most instances, the student would be marked "Fail" for exceeding the speed limit by more than 3-4 mph, or for driving so slowly that he creates a hazard. The student would be scored "Pass" for the speed variable by decelerating, accelerating, or maintaining a steady speed when appropriate, i.e., travelling at a speed which is safe and appropriate for existing conditions.

Signaling - Hand and/or automatic direction change indications, including manual cancellation of automatic signals (e.g., a student who signals for a turn too early, or omits the signal for a turn would fail on this variable).

Observing - Obvious movements of the eyes, head, and shoulders which the rater identifies as part of the driver's visual searching behavior. Braking, covering the brake, or evasive steering in the presence of a hazard or as a response to the movement or signals of other vehicles would indicate that the student was "observing" properly.

Traffic Control - Responses to signals, signs, police, firepolice, firemen, barricades, etc.

Task - The rater's judgment of the overall performance on the task, based upon a review of the scores on all task elements.

Raters' Comments - Provided for each maneuver. May be used to rate additional details of student performance (e.g., if "Speed" was marked "Fail," rater might use "Comments" section to denote "too fast" or "too slow;" if "Path" was marked "Fail," rater may note "waited too long for gap," or "turned too wide," etc.). If student could not be scored on a maneuver or most of its elements because of some unusual circumstance (e.g., child runs out into car's path), this should be noted in the comments section for that maneuver. Upon test completion, the rater should use the blank score sheets provided at the end of the route to provide details on student performance--in this case, perceiving and reacting to a hazard.

Blank Score Sheets - Supplied at the end of the test route to rate "Unprogrammed Checks," (see page 210), but should not be used at the expense of rating standard items.

INDEX TO DEFINITIONS FOR MANEUVER CHECKS

Performance Check	Page
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Oncoming Traffic Left Turn	201
Cross Traffic Left Turn	203
Standard Right Turn	203
Cross Traffic Right Turn	204
Standard Through	204
Hazard Response	205
Normal Transit	206
Curves	206
Hills	207
Passing Judgment	208
Merge	208
Exit	209
Bridge	209
Lane Change	210
Shut-Down	210
Unprogrammed Checks	210
Additional Observations	211

PRE-OP

The only variable checked for "Pre-Op" is "Task." The student would be marked "Fail" for "Task" if he fails to do one of the following or if these tasks are not performed in the proper order: (1) Locks doors; (2) Puts key in ignition; (3) Adjusts seat, head restraint, and mirrors; and (4) Fastens seat belt and shoulder harness.

STANDARD LEFT TURN

This check is generally made at an intersection which either has very little traffic or in which left turning traffic is sufficiently well controlled to create little problem for the driver (e.g., left turn arrow). The scoring interval should begin approximately 100 feet prior to the turn and end approximately 100 feet following the turn.

PATH

Initial Path

Pass--The student should be in the left-most lane or, if it is a two-lane road, the left portion of the lane.

Fail--Making the left turn from a center or right lane; turning from the right-hand portion of the lane on a two-lane road.

Path Throughout Turn

Pass--The student should make a fairly sharp left-angle turn.

Fail--(1) Too Sharp: Turning so sharply as to cut across the oncoming traffic lanes (left lane) at an oblique angle, or to encroach upon the right-hand lanes of the street he is turning into.

(2) Too Wide: Making the turn so wide that an overcorrection is needed to prevent striking the curb or entering the wrong lane.

Final Path (i.e., the lane, or position within the lane, on the road the student is entering)

Pass--The student should enter the left-hand most lane of traffic, unless that lane is blocked or otherwise inaccessible.

Fail--Entering any lane other than the left-most lane (unless it has been necessary to do so).

The student should maintain the correct path in all stages of the turn in order to pass "Path."

Standard Left Turn (Continued)

POSITION

"Position" for a Standard Left Turn is defined as the lateral and longitudinal position of the vehicle when it is stopped, i.e., waiting to turn.

SPEED

"Speed" for a Standard Left Turn is the value indicated by the car's speedometer prior to, during, and upon completion of the turn. The driver is scored on his ability to decrease or increase his speed smoothly and when appropriate prior to, during, and upon completion of the turn.

SIGNALLING

"Signalling" refers to the use of mechanical or hand signals to indicate the intention to turn.

N/A --Indicates an occasion where no turn signal is required.
Pass--Signalling at the earliest possible moment, without causing confusion to traffic behind.
Fail--(1) Late: Signalling after the intersection has been reached.
(2) Too Early: Signalling at a point that would lead following traffic to believe the driver intends to turn at a spot in advance of the place he actually intends to turn.
(3) Not signalling at all.

OBSERVING

"Observing" refers to the student's observation of cross traffic prior to making the turn.

Pass--Checking traffic from both left and right.
Fail--Checking traffic in one direction only or making no check at all.

TRAFFIC CONTROL

Pass--Student responds appropriately to any signals, signs, or lane markings encountered at the intersection in which the turn is made.
Fail--Student does not respond appropriately to signals, signs, or lane markings.

Standard Left Turn (Continued)

TASK

"Task" refers to the rater's judgment of the driver's overall performance on the left turn maneuver.

ONCOMING TRAFFIC LEFT TURN

This check is made at an intersection in which cross traffic is controlled and where the student's primary problem is crossing the path of oncoming traffic. The scoring interval should begin approximately 100 feet prior to the turn and end approximately 100 feet following the turn.

PATH

Initial Path

Pass--The student should be in the left-most lane or, if it is a two-lane road, the left portion of the lane.

Fail--Making a left turn from a center or right lane; turning from the right-hand portion of the lane on a two-lane road.

Path Throughout Turn

Pass--(See Standard Left Turn) In addition, the student should accept any gap that allows him to complete the turn without interfering with the progress of an oncoming car.

Fail--(See Standard Left Turn) In addition, the following variables should be considered for an Oncoming Traffic Left Turn:

(1) Unsafe: Accepting a gap that causes an oncoming car to decelerate.

(2) Overcautious: Passing up one or more acceptable gaps.

Final Path (i.e., the lane, or position within the lane, on the road the student is entering)

Pass--The student should enter the left-hand most lane of traffic, unless that lane is blocked or otherwise inaccessible.

Fail--Entering any lane other than the left-most lane (unless it has been necessary to do so).

The student should maintain the correct path in all stages of the turn in order to pass "Path."

Oncoming Traffic Left Turn (Continued)

POSITION

"Position" for an Oncoming Traffic Left Turn is defined as the lateral and longitudinal position of the vehicle when it is stopped, i.e., waiting to turn.

N/A --This check would be used if the driver were not required to await a gap in oncoming traffic.

Pass--The student should enter the intersection to make a left turn, but should not proceed so far as to force oncoming traffic to make a left turn behind him.

Fail--(1) Too Far: Entering the intersection so far as to require left-turning traffic to turn behind him.
(2) Too Short: Entering the intersection just a little ways, or not entering the intersection at all (unless prevented from doing so by traffic already in the intersection).
(3) Wheels Turned: Waiting for a gap in oncoming traffic with the wheels turned.

SPEED

"Speed" for an Oncoming Traffic Left Turn is the value indicated by the car's speedometer prior to, during, and upon completion of the turn. The driver is scored on his ability to decrease or increase vehicle speed smoothly and when appropriate prior to, during and upon completion of the turn.

SIGNALLING

See Standard Left Turn, page 200.

OBSERVING

"Observing" refers to the student's observation of oncoming traffic prior to making a turn.

Pass--Selecting a gap that allows him to complete the turn without interfering with the progress of an oncoming car.

Fail--Accepting a gap that causes an oncoming car to decelerate, or passing up one or more acceptable gaps.

TRAFFIC CONTROL

See Standard Left Turn, page 200.

Oncoming Traffic Left Turn (Continued)

TASK

"Task" refers to the rater's judgment of the driver's overall performance on the oncoming traffic left turn maneuver.

CROSS TRAFFIC LEFT TURN

This check would be made at an uncontrolled intersection where there is a reasonable expectation of cross traffic. The checks and scoring interval are the same as for "Oncoming Traffic Left Turn," except that gap acceptance on "Path Throughout Turn" applies to cross traffic (from both directions). In addition, the "Traffic Control" variable will not be applicable, except as it applies to lane markings.

STANDARD RIGHT TURN

This check is generally made at an intersection which either has very little traffic or in which traffic is sufficiently well-controlled to create little problem for the driver. The checks and scoring intervals are the same as for "Standard Left Turn" with the following exceptions:

PATH

Initial Path

Pass--The student should be in the right-most lane or, if it is a two-lane road, the right portion of the lane.

Fail--Making the right turn from a center or left lane; turning from the left-hand portion of the lane on a two-lane road.

Path Throughout Turn

Pass--The student should make a sharp right turn (staying within the lane throughout the turn), and enter the right-most transit lane, unless that lane is blocked.

Fail--(1) Too Wide: Turning in such a way as to encroach upon the lane adjacent to the right lane.
(2) Too Sharp: Turning so sharply as to cause the right rear tire to cut inside the paved surface (e.g., over the curb).

Final Path

Pass--The student should enter the right-most lane of traffic, unless that lane is blocked or otherwise inaccessible.

Fail--Entering any lane other than the right-most lane (unless it has been necessary to do so).

Standard Right Turn (Continued)

The student should maintain the correct path in all stages of the turn in order to pass "Path."

CROSS TRAFFIC RIGHT TURN

This check would be made at an uncontrolled intersection where there is a reasonable expectation of cross traffic. The checks and scoring interval are essentially the same as for "Standard Right Turn." "Path" variables are the same as for "Cross Traffic Left Turn" (page 203), except that gap acceptance on "Path Throughout Turn" applies only to traffic approaching from the left. In addition, the "Traffic Control" variable will not be applicable, except as it applies to lane markings.

STANDARD THROUGH

This check would be made when the student is passing directly through an intersection--that is, he is not turning. The scoring interval begins approximately 100 feet prior to the intersection and ends when the intersection is cleared.

PATH

"Path" for a Standard Through is defined as the lateral and longitudinal positioning of the vehicle in the traffic lane which permits the driver to cross the intersection with the least interference from other traffic. This would generally be the right lane on a four-lane road (particularly if left-turning traffic blocks the left lane) and the center lane on a six-lane road.

POSITION

"Position" for a Standard Through is defined as the lateral and longitudinal position of the vehicle when it is stopped, i.e., waiting to cross the intersection. This would apply only if the traffic light were red, or if the student needed to stop for any other reason (e.g., conflicting traffic).

SPEED

"Speed" for Standard Through is the value indicated by the car's speedometer throughout the maneuver. The driver is scored on his ability to decrease or increase his speed smoothly and when appropriate.

Standard Through (Continued)

SIGNALLING

"Signalling" would not usually be applicable in a Standard Through, unless the driver must brake (rather than merely letting up on the accelerator) in order to slow for cross traffic or a red light, thereby warning traffic behind.

OBSERVING

"Observing" refers to the student's observation of cross traffic prior to entering the intersection. This check should be made even if cross traffic is controlled.

TRAFFIC CONTROL

Pass--Student responds appropriately to any signals, signs, or lane markings encountered at the intersection.

Fail--Student does not respond appropriately to signals, signs, or lane markings.

TASK

"Task" refers to the rater's judgment of the driver's overall performance on the Standard Through Maneuver.

HAZARD RESPONSE

This check would be made through a segment of the route in which the student is likely to encounter a possible hazard from cars, pedestrians, cyclists, etc. . . . , entering the roadway. Examples of such areas include (1) busy shopping areas where there is a general mid-block movement of pedestrian traffic; (2) short term, metered on-street parking areas where cars and drivers move in and out frequently; (3) shopping centers where pedestrians and vehicular traffic follow an irregular pattern; and (4) playgrounds or streets where children are likely to be playing. It is the driver's response to potential hazards, before they enter the path of the car, that is to be checked.

If no potential hazard arises over that segment of the route where the check is called for, the test administrator should check "Not Applicable" for "Task." If a potential hazard does arise, all of the variables listed for the maneuver should be checked. The general definitions listed on pages 196 and 197 would apply here.

NOTE: The student would be checked "Fail" for the "Task" if he responds to the potential hazard, but does not exercise sufficient caution (e.g., comes off the accelerator when a braking response is required), or if the student fails to respond at all, indicating that he has not even perceived the potential hazard.

If a hazard response is called for and it has not been programmed, the rater should note this in the "Comments" section for that maneuver. In some cases, if an unprogrammed response is called for during a programmed maneuver, the latter would be marked "Not Applicable" and the former would be rated on the blank score sheets provided at the end of the route (See "Raters' Comments," page 197.)

NORMAL TRANSIT

This check would be made for approximately one or two city blocks along a relatively straight stretch of roadway. The scoring interval occurs between any two selected points, x and y. The general definitions on pages 196 and 197 will apply to Normal Transit. However, the following variable definitions are peculiar to this maneuver:

PATH

Pass--The student positions the car within a lane that represents the best compromise between hazards from the left and right. In addition, the student must maintain at least a two-second interval from traffic ahead at all times throughout the designated segment.

Fail--(1) Too Far Left: Not leaving sufficient separation from oncoming traffic; or encroaching upon an adjacent lane.
(2) Too Far Right: Not leaving sufficient lateral separation from parked vehicles or pedestrians along the right.
(3) Improper Following Distance: Closing to less than two seconds from a car ahead on one or more occasions over the designated segment.

SPEED

The student should be check "Fail" for "Speed" if he exceeds the speed limit by more than 4-5 mph at one or more points along the route segment. In addition, if he falls below the speed limit sufficiently to create a possible hazard to traffic behind at one or more points along the route segment, he would be scored "Fail."

CURVES

This check would be made on the highway, where there is a bend in the roadway of sufficient curvature as to require a speed adjustment on the part of the driver. The scoring interval can be between any two designated points before and after the curve. One or more curves can be included in a check. The general definitions on pages 196 and 197 will apply to Curves. However, the following variable definitions are peculiar to this maneuver:

PATH

Pass--Remaining completely within the travel lane throughout the curve.
Fail--(1) Cross Left: The student encroaches upon a lane to the left at some point in the curve.
(2) Cross Right: The student encroaches upon a lane to the right (or the shoulder) at some point in the curve.

SPEED

The student would be checked "Pass" for "Speed" if he enters the curve at a speed which is appropriate to the curvature, superelevation, traction, etc. of the curve and if he maintains a steady pressure on the accelerator throughout the curve.

The student would be checked "Fail" for this variable if he enters the curve at a speed which is inappropriately high, or if he accelerates too rapidly once in the curve. The student would also be checked "Fail" if he enters the curve at a speed which is inappropriately low, or if he decelerates too much (possibly creating a skid situation) once on the curve.

HILLS

This check is made on an uphill or downhill of sufficient grade to require a speed adjustment. The scoring interval can be between two designated points before and after the hill. The general definitions on pages 196 and 197 will apply to Hills. However, the following variable definitions are peculiar to this maneuver:

PATH

Pass--The student will generally keep as far to the right as possible upon approaching a crest or dip.
Fail--Lateral or longitudinal positioning throughout the maneuver is viewed by the rater as "unsafe."

SPEED

The student would be checked "Fail" for "Speed" if he does not slow down when approaching a crest or dip, if he drives too fast or too slowly at any time throughout the maneuver, or if he applies the brake when it is unnecessary to do so.

PASSING JUDGMENT

This check would be made on a relatively long, straight stretch of a two-lane roadway, where passing distance may be restricted by an oncoming car. It is set up by asking the student at a given point on the route if he "has enough time to pass." The student then responds by saying whether he would or would not pass at that point. The rater checks only the "Task" variable for this maneuver--Pass or Fail.

Pass--Nine to fourteen seconds should elapse between the time the student indicates he would pass and the time the car arrives at the oncoming car.

Fail--Less than nine seconds.

Prior to test administration, each student should be briefed as to the nature and intent of the passing maneuver. The student must be informed that he will not actually make an attempt to pass, but will merely make a decision about whether he would have time to pass safely at the time the instructor asks, "Do you have enough time to pass?" Driver should also be told that if there is not a car in front of his vehicle at the time the question is asked, he should assume that there is a car in front of him.

MERGE

This check is generally made on an entrance to a freeway or expressway. It may also be made on any oblique approach to a highway. The scoring interval begins 100 feet before entering the freeway and ends approximately 100 feet following entrance to the freeway. The general definitions on pages 196 and 197 will apply to Merge. However, the following variable definitions are peculiar to this maneuver:

PATH

Pass--In addition to correct lateral and longitudinal positioning of the vehicle throughout the maneuver, the student should accept any gap that allows him to enter the expressway without interfering with the progress of vehicles on the expressway.

Fail--In addition to not maintaining a safe lateral or longitudinal position, the following would also constitute a "Fail":

(1) Unsafe: Accepting a gap that causes a vehicle on the expressway to decelerate.

(2) Overcautious: Passing up one or more acceptable gaps.

Merge (Continued)

SPEED

The student would be marked "Fail" for "Speed" if he drives too fast at any time throughout the maneuver, if he enters the expressway at a speed that is less than desirable or necessary, or if he comes to a complete stop (unnecessarily) before entering.

EXIT

This check would be made at any point throughout the route in which the student leaves the expressway or freeway at an oblique angle. The scoring interval begins approximately 100 feet before leaving the freeway and ends approximately 100 feet following the exit (or at the end of the ramp, if there is one). The general definitions on pages 196 and 197 will apply to Exit. However, the following variable definitions are peculiar to this maneuver:

PATH

Pass--In addition to correct lateral and longitudinal positioning of the vehicle throughout the maneuver, the student should enter the deceleration lane at the first safe opportunity.

Fail--In addition to not maintaining a safe lateral or longitudinal position throughout the maneuver, the student would be marked "Fail" for entering the deceleration lane at an inappropriate point.

SPEED

For the Exit maneuver, the student should maintain the highway or expressway speed until he enters the deceleration lane, then decelerate to the posted (or safe) speed once he is on the off-ramp or deceleration lane. The student would be checked "Fail" for "Speed" if he drove too fast on the off-ramp or deceleration lane. He would also be checked "Fail" if he decelerates on the main highway or if he decelerates inordinately.

BRIDGE

The checks made when the driver crosses the bridge are essentially the same as for "Normal Transit," page 206. The scoring interval occurs at any two selected points--one prior to entering the bridge and the other after having crossed the bridge.

LANE CHANGE

The scoring interval for a Lane Change begins immediately after the given cue and continues until car is positioned in designated lane. The general definitions on pages 196 and 197 will apply to Lane Change. However, the rater should be particularly aware of the following variables:

(1) Path--in relation to "gap acceptance." The student should not accept a gap that requires a vehicle in the adjacent lane to decelerate. In addition, the student should not be "overcautious"--that is, passing up one or more acceptable gaps.

(2) Observing--the student should make both mirror and head checks.

SHUT-DOWN

The only variable checked for "Shut-Down" is "Task." The student would be marked "Fail" for "Task" if he fails to do one of the following or if these tasks are not performed in the proper order: (1) Puts gear selector lever in PARK; (2) Turns ignition OFF; (3) Sets parking brake; and (4) Removes safety restraints.

UNPROGRAMMED CHECKS

These checks refer to infrequent or unprogrammed events which may occur at any time throughout the route. The rater may note them briefly in the "Rater's Comments" section provided for each maneuver, and then, if needed, clarify the check on the blank score sheet provided at the end of each route. (This clarification would take place after the test has been administered, or during change of drivers.) The following are some examples of unprogrammed checks, which should be entered on the blank score sheets provided at the end of the route.

EMERGENCY VEHICLES

The student should be checked "Pass" for the "Task" if he yields the right of way (pulls to the right and stops) to emergency vehicles. If the student fails to make an appropriate response, or fails to make any response at all when confronted with an emergency vehicle, he would be checked "Fail" for "Task" on the blank score sheet provided at the end of the route.

YELLOW LIGHT

This check is made when a traffic signal changes from green to yellow as the student enters the intersection. If the student can safely accelerate through the intersection, he should do so. If he cannot safely accelerate through the intersection, he should avoid stopping so abruptly that he endangers following traffic.

LANE BLOCKAGE

The student should respond appropriately and well in advance if the travel lane is blocked ahead. The student should be checked "Fail" for this task if he becomes unnecessarily trapped by a lane blockage, or if he forces his way into other traffic, causing other vehicles to adjust to him.

ANY EVENT CALLING FOR A HAZARD RESPONSE

ADDITIONAL OBSERVATIONS

Any additional observations or driver errors which could have had an adverse effect upon the safety of the driver or others should be detailed on the blank score sheet provided at the end of each route.

Appendix G-1

ATTITUDE TEST (Preliminary)

Preliminary Form

First, Second, and Third Revision: Item Responses

Preliminary Form

GENERAL DRIVING KNOWLEDGE TEST

This is a test to find out how much you know about driving. It is not to find out whether you remember specific facts, but rather to see how well you understand what goes into making a safe driver.

Please look at each item and pick out the answer that seems to you to be the best answer. On the answer sheet, fill in the space that corresponds to the answer you have chosen.

Example:

Dirty windshields:

a. Lead to eye strain
b. Can cause accidents
c. Is an annoyance

If you consider "c," "is an annoyance," to be the best answer, you would fill in the "c" column on the answer sheet as shown below:

1. Pulling away quickly:
   a. Is a sign of an unsafe driver.
   b. Is a waste of gas.
   c. Can sometimes cause an accident.

2. Bad tires:
   a. Make the car hard to handle.
   b. Are a major cause of accidents.
   c. Call for slower speeds.

3. Changing lanes frequently in traffic:
   a. Calls for great alertness.
   b. Is a sign of impatience.
   c. Is a major accident cause.

4. The number of injuries that could be prevented by the use of seat belts each year is:
   a. 50,000
   b. 200,000
   c. 1,000,000

5. *Not* coming to a complete stop at a stop sign:

   a. Is extremely unsafe.
   b. Is illegal
   c. Is all right if there is no other traffic around.

6. People who get speeding tickets:

   a. Generally tend to drive more than people who don't
   b. Are basically unsafe drivers.
   c. Are generally ones who are unlucky enough to get caught.

7. Driving in bad weather:

   a. Requires extra caution.
   b. Should be avoided if possible.
   c. Can be as safe as driving in good weather.

8. Which is the truest statement concerning speed and safe driving:

   a. The faster you drive, the more alert you must be.
   b. The faster you drive, the greater your chances of having an accident.
   c. People who speed cause most of the accidents.

9. Concerning drinking and driving:

   a. Never drive if you've had something to drink.
   b. Just a small amount of alcohol can make you unsafe.
   c. You can drive safely if you are careful the way you drink.

10. When passengers in a car create a nuisance, the best thing to do is:

    a. Ignore them
    b. Tell them to stop it.
    c. Pull to the curb and refuse to continue until they stop.

11. If someone is "tailgating" you, the best thing to do is:

    a. Flash your brake lights a few times as a warning.
    b. Slow down and make the tailgater pass.
    c. Speed up; the fault is probably yours.

12. When you come to kids playing by the side of the road, you should:

    a. Slow down and proceed with caution.
    b. Sound your horn to warn them.
    c. Move to the far left-hand side of the road and continue.

13. The best thing to do if you are with someone who is "high on grass" is:

    a. Arrange to go home with someone else.
    b. Hide their car keys.
    c. Put them in a cab and drive their car home.

14. If you are passing Car A on a two-lane road and oncoming Car B suddenly appears, the best thing to do is:

a. Slow down since Car B will probably speed up for you.
b. Speed up and complete the pass, since Car B will probably slow down for you.
c. Watch Car B and wait until he commits himself before deciding whether to speed up or slow down.

15. When waiting at a red light, you should:

a. Keep an eye out for the yellow light (for the cross street) so you'll be ready to move as soon as your light turns green.
b. Keep an eye on the red light and be ready to move as soon as it turns green.
c. Keep an eye on cross traffic, checking the light frequently so you can tell when it turns green.

16. The best frame of mind for good driving is:

a. Relaxed
b. Anxious
c. Confident

17. If you are driving a small car, you should leave a following distance that is:

a. Longer than if you were driving a full size car.
b. Shorter than if you were driving a full size car.
c. The same as if you were driving a full size car.

18. The best driver is one who:

a. Gives others credit for being safe drivers.
b. Assumes that others are basically unsafe drivers.
c. Minds his own driving and lets others worry about theirs.

19. Having an accident:

a. Means you need to improve your driving.
b. Is something that will happen to anyone sooner or later.
c. Means that you are an unsafe driver.

20. Which of the following describes how a handicapped driver compares with a normal driver:

a. He's safer because he tends to compensate for his handicap by increased caution.
b. He is less safe because good driving demands all you've got.
c. There is no difference because handicapped drivers can't get a license unless they're safe.

First Revision

GENERAL DRIVING KNOWLEDGE TEST

This is a test to find out how much you know about driving. It is not to find out whether you remember specific facts, but rather to see how well you understand what goes into making a safe driver.

Please look at each item and pick out the answer that seems to you to be the best answer. On the answer sheet, fill in the space that corresponds to the answer you have chosen.

Example:

Dirty windshields:

a. Lead to eye strain
b. Can cause accidents
c. Are an annoyance

If you consider "c," "are an annoyance," to be the best answer, you would fill in the "c" column on the answer sheet as shown below:

1. Pulling away quickly:

45 a. Is a waste of gas.
74 b. Can sometimes cause an accident.
66 c. Is a sure sign of an unsafe driver.

2. Bad tires:

74 a. Can make the car hard to handle.
20 b. Call for slower speeds.
90 c. Are a major cause of accidents.

3. Changing lanes frequently in traffic:

53 a. Calls for alertness.
69 b. Is a sign of impatience.
64 c. Is a major accident cause.

* Items requiring revision

4. The number of injuries that could be prevented by the use of seat belts each year is:

59 a. 50,000
81 b. 200,000
45 c. 500,000

*5. Not coming to a complete stop at a stop sign:

101 a. Is illegal.
6 b. Is all right if there is no other traffic around.
79 c. Is extremely unsafe.

6. People who get speeding tickets:

21 a. Generally tend to drive more than people who don't.
112 b. Tend to be unsafe drivers.
49 c. Are the ones who cause most of the accidents.

*7. Driving in bad weather:

150 a. Requires extra caution.
1 b. Can be as safe as driving in good weather.
34 c. Should always be avoided if possible.

*8. Which is the truest statement concerning speed and safe driving:

39 a. To drive fast requires alertness.
134 b. The faster you drive, the greater your chances of having an accident.
12 c. People who speed cause most of the accidents.

9. Concerning drinking and driving:

35 a. You can drive safely if you are careful about the way you drink.
65 b. Just a small amount of alcohol can make you unsafe.
85 c. Never drive if you've had anything to drink.

*10. When passengers in a car create a nuisance, the best thing to do is:

15 a. Ignore them.
65 b. Tell them to stop it.
85 c. Pull to the curb and refuse to continue until they stop.

11. If someone is "tailgating" you, the best thing to do is:

40 a. Tap your brakes a few times as a warning.
31 b. Slow down and make the tailgater pass.
113 c. Pull over and let him pass.

*12. When you come to kids playing by the side of the road, you should:

5 a. Move to the far left-hand side of the road and continue.
146 b. Slow down and proceed with caution.
35 c. Sound your horn and wait till they stop playing before you continue.

*13. If you are passing a car on a two-lane road and suddenly see a truck coming at you, the best thing to do is:

19 a. Speed up and complete the pass, since the car will probably slow down for you.
11 b. Watch the car and wait until he commits himself before deciding.
156 c. Slow down and pull back in lane.

*14. When waiting at a red light, you should:

9 a. Keep an eye out for the yellow light (for the cross street). so you'll be ready to move as soon as your light turns green.
28 b. Keep an eye on the red light and be ready to move as soon as it turns green.
149 c. Keep an eye on cross traffic, checking the light frequently, so you can tell when it turns green.

*15. The best frame of mind for good driving is:

67 a. Relaxed.
112 b. Confident.
6 c. Worried.

16. If you are driving a small car, you should leave a following distance that is:

30 a. Shorter than if you were driving a full size car.
124 b. The same as if you were driving a full size car.
31 c. Longer than if you were driving a full size car.

17. The best driver is one who:

27 a. Minds his own driving and lets others worry about theirs.
50 b. Gives others credit for being safe drivers.
108 c. Assumes that others are basically unsafe drivers.

*18. Having an accident:

67 a. Is something that will happen to anyone sooner or later.
108 b. Means you need to improve your driving.
9 c. Means that you are an unsafe driver.

19. Which of the following describes how a handicapped driver compares with a normal driver:

71 a. He tends to make up for his handicap by being extra cautious.
19 b. He is less safe because good driving demands everything you've got.
93 c. There is no difference because handicapped drivers can't get a license unless they're safe.

20. Driving 12 hours in one day:

31 a. Is safe if you are well rested.
114 b. Is not a good idea if you can help it.
38 c. Is asking for trouble.

Second Revision

GENERAL DRIVING KNOWLEDGE TEST

Circle the answer you think is best.

1. NOT coming to a complete stop at a stop sign:

46 a. Is illegal.
30 b. Can cause an accident
24 c. Is extremely unsafe

* 2. Driving in bad weather:

83 a. Requires extra caution.
4 b. Is a risky business
13 c. Should always be avoided if possible

3. When passengers in a car become a nuisance, the best thing to do is:

22 a. Not let it distract you.
18 b. Tell them to stop it.
60 c. Pull to the curb and refuse to continue until they stop.

4. When you come to kids playing by the side of the road, you should:

19 a. Sound your horn to let them know you are coming.
48 b. Pass them very slowly.
33 c. Sound your horn and wait until they stop playing before you continue.

5. You are passing a car on a two lane road. As you pull alongside, you see a truck in the distance. You should:

14 a. Complete the pass as quickly as possible.
31 b. Speed up or slow down depending upon what the other car does.
55 c. Slow down and drop back into lane.

6. When waiting at a red light, you should:

13 a. Keep an eye on the light and be ready to move as soon as it turns green.
36 b. Keep an eye on cross traffic and move out when you notice the light has changed.
50 c. Wait until traffic stops completely before you start to move out.

* 7. The best frame of mind for good driving is:

62 a. Relaxed
37 b. Confident
1 c. A little nervous

8. Having an accident:

24 a. Is something that happens to everyone sooner or later.
40 b. Means your driving could stand improvement.
36 c. Is a sure sign of unsafe driving.

9. Which is the truest statement concerning speed and safe driving:

18 a. To drive fast requires alertness.
44 b. Driving fast increases the chances of an accident.
38 c. Driving too fast is a major cause of accidents.

*Items requiring further revision

Third Revision

GENERAL DRIVING KNOWLEDGE TEST

1. Driving in bad weather:

45 a. Requires extra caution.
1 b. Tends to be rather dangerous
54 c. Should always be avoided if possible.

2. The best frame of mind for good driving is:

45 a. Relaxed.
2 b. Confident.
53 c. Wary.

Appendix G-2

ATTITUDE TEST (Final)

Test Administration Guidelines

Final Form

Item Responses

TEST ADMINISTRATION GUIDELINES

GENERAL DRIVING KNOWLEDGE TEST

PURPOSE:

The General Driving Knowledge Test is intended to be an indirect measure of student attitudes toward safety in driving.

TEST ADMINISTRATION:

Dates: Prior to exposure to course materials (i.e., during Unit 1) and upon completion of the course (after Unit 8).

Time Required: 10-15 minutes

Materials Required:
(1) One test for each student
(2) One set of instructions and an answer sheet (IBM) for each student
(3) One #2 pencil for each student

INSTRUCTIONS TO STUDENTS:

"Today you will be taking a test on driving knowledge. This test, though, is not to find out whether you remember specific facts, but rather to see how well you understand what goes into making a safe driver.

"It is important that you work individually and quietly. I am going to hand out the test now. Please don't start until I say so." (Hand out tests with instructions and answer sheet clipped to the front of the test, and pencils)

"Detach the answer sheet from the test and read the instructions carefully. (pause) Are there any questions?" (pause)

"Remember - For each question, choose the ONE answer you consider to be the BEST answer.

- Put your answers only on the answer sheet.

You have 15 minutes to complete the test. You may begin."

GENERAL DRIVING KNOWLEDGE TEST

INSTRUCTIONS

(To be attached to the front page of each test)

Please use the pencil provided

Take the Answer Sheet and:

- Where it says NAME write your name
- Write the name of your SCHOOL on the answer sheet
- Write today's DATE on the answer sheet

When you take the test, you should:

- Pick the answer for each question that seems to you to be the BEST answer
- Fill in the blank corresponding to the correct answer ON THE ANSWER SHEET
- Not write on the test itself

EXAMPLE: 1. Dirty windshields:

a) lead to eye strain

b) can cause accidents

c) are an annoyance

If you think "c", "are an annoyance," is the best answer, you would find the number "1" on the answer sheet and then fill in the blank next to the letter "c".

Final Form

GENERAL DRIVING KNOWLEDGE TEST

This is a test to find out how much you know about driving. It is not to find out whether you remember specific facts, but rather to see how well you understand what goes into making a safe driver.

Please look at each item and pick out the answer that seems to you to be the best answer. On the answer sheet, fill in the space that corresponds to the answer you have chosen.

1. Pulling away quickly:

    a. Is a waste of gas.
    b. Can sometimes cause an accident.
    c. Is a sure sign of an unsafe driver.

2. Bad tires:

    a. Can make the car hard to handle.
    b. Call for slower speeds.
    c. Are a major cause of accidents.

3. Changing lanes frequently in traffic:

    a. Calls for alertness.
    b. Is a sign of impatience.
    c. Is a major accident cause.

4. The number of injuries that could be prevented by the use of seat belts each year is:

    a. 50,000
    b. 200,000
    c. 500,000

5. NOT coming to a complete stop at a stop sign:

    a. Is illegal.
    b. Can cause an accident.
    c. Is extremely unsafe.

6. People who get speeding tickets:

    a. Generally tend to drive more than people who don't.
    b. Tend to be unsafe drivers.
    c. Are the ones who cause most of the accidents.

7. Driving in bad weather:

   a. Requires extra caution.
   b. Tends to be hazardous.
   c. Should always be avoided if possible.

8. Which is the truest statement concerning speed and safe driving:

   a. To drive fast requires alertness.
   b. The faster you drive, the greater your chances of having an accident.
   c. People who speed cause most of the accidents.

9. Concerning drinking and driving:

   a. You can drive safely if you are careful about the way you drink.
   b. Just a small amount of alcohol can make you unsafe.
   c. Never drive if you've had anything to drink.

10. When passengers in a car become a nuisance, the best thing to do is:

    a. Not let it distract you.
    b. Tell them to stop it.
    c. Pull to the curb and refuse to continue until they stop.

11. If someone is "tailgating" you, the best thing to do is:

    a. Tap your brakes a few times as a warning.
    b. Slow down and make the tailgater pass.
    c. Pull over and let him pass.

12. When you come to kids playing by the side of the road, you should:

    a. Sound your horn to let them know you are coming.
    b. Pass them very slowly.
    c. Sound your horn and wait until they stop playing before you continue.

13. You are passing a car on a two lane road. As you pull alongside, you see a truck in the distance. You should:

    a. Complete the pass as quickly as possible.
    b. Speed up or slow down depending upon what the other car does.
    c. Slow down and drop back into lane.

14. When waiting at a red light, you should:

    a. Keep an eye on the light and be ready to move as soon as it turns green.
    b. Keep an eye on cross traffic and move out when you notice the light has changed.
    c. Wait until traffic stops completely before you start to move out.

15. The best frame of mind for good driving is:

    a. Relaxed.
    b. Confident.
    c. Wary.

16. If you are driving a small car, you should leave a following distance that is:

    a. Shorter than if you were driving a full size car.
    b. The same as if you were driving a full size car.
    c. Longer than if you were driving a full size car.

17. The best driver is one who:

    a. Minds his own driving and lets others worry about theirs.
    b. Gives others credit for being safe drivers.
    c. Assumes that others are basically unsafe drivers.

18. Having an accident:

    a. Is something that happens to everyone sooner or later.
    b. Means your driving could stand improvement.
    c. Is a sure sign of unsafe driving.

19. Which is the truest statement concerning speed and safe driving:

    a. To drive fast requires alertness.
    b. Driving fast increases the chances of an accident.
    c. Driving too fast is a major cause of accidents.

20. Driving 12 hours in one day:

    a. Is safe if you are well rested.
    b. Is not a good idea if you can help it.
    c. Is asking for trouble.

On this part of the test, there are no right or wrong answers. Read the statements below and pick one of the following words that best says how you feel about the statement:

A. Always
B. Usually
C. Sometimes
D. Rarely
E. Never

Fill in the space on your answer sheet that corresponds to the word you have chosen to fill in the blanks in the statements below.

21. I feel that young people are ____________ much better drivers than are middle-aged people.

22. I feel that policemen are __________ sincere in enforcing traffic laws.

23. I __________ feel full of pep when I get behind the wheel.

24. If I see a police officer, I am __________ more careful.

25. Over-careful drivers ___________ cause more accidents than the so-called reckless ones.

26. I ____________ get a feeling of real power when driving a car.

27. I ____________ feel that slow drivers should be kept off the highways.

28. New drivers should __________ be required to take a course in driver education.

29. I _____________ feel that unsafe drivers should be deprived of the right to drive.

30. I _____________ feel that accidents (mishaps) don't just happen; they are caused.

31. I _____________ like to get everything out of a car that it has in it.

32. I _____________ feel that the chief work of most policemen should be traffic control.

33. I _____________ get impatient in heavy traffic.

34. Old, defective cars should ___________ be kept off the road.

35. I ___________ feel that drivers should be given more freedom in obeying traffic signs.

Continue using these choices:

A. Always
B. Usually
C. Sometimes
D. Rarely
E. Never

36. People should _________ drive when they are angry.

37. Passing on hills and curves is __________ exceedingly dangerous.

38. It is __________ necessary to stop at "stop" signs if no other cars are in sight.

39. I ___________ like to put extras on my car to attract attention.

40. I ___________ feel that police officers are rougher on teenagers than on adults.

41. Society should __________ have the right to question the way I drive.

42. Attitudes toward driving are _________ more important than ability to handle a car.

43. I __________ like to take chances when I'm driving.

44. I __________ feel that traffic laws are set up to promote safety.

45. Courtesy toward other drivers is __________ important.

46. I ___________ feel somewhat nervous when I drive a car.

47. I ___________ get more fun out of driving a car than in any other activity.

48. I ___________ feel that I am more courteous than the average driver.

ATTITUDE TEST % DISTRIBUTION OF RESPONSES AND % DIFFERENCE BETWEEN PRE AND POST

1. Pulling away quickly:

   a. Is a waste of gas.
   b. Can sometimes cause an accident.
   c. Is a sure sign of an unsafe driver.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	6.0	8.8	2.8	9.4	11.2	1.8
b.	64.7	65.9	1.2	62.8	65.4	2.6
c.	28.9	25.3	-3.6	27.8	22.9	-4.9

2. Bad tires:

   a. Can make the car hard to handle.
   b. Call for slower speeds.
   c. Are a major cause of accidents.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	39.8	53.5	13.7	46.1	53.7	7.6
b.	5.0	10.6	5.6	10.0	11.2	1.2
c.	55.2	35.9	-19.3	43.9	33.0	-10.9

3. Changing lanes frequently in traffic:

   a. Calls for alertness.
   b. Is a sign of impatience.
   c. Is a major accident cause.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	38.8	36.5	-2.3	42.8	30.3	-12.5
b.	30.8	32.9	2.1	29.4	41.0	11.6
c.	29.9	30.0	0.1	27.8	28.2	0.4

4. The number of injuries that could be prevented by the use of seat belts each year is:

   a. 50,000
   b. 200,000
   c. 500,000

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	26.4	31.8	5.4	31.1	31.9	0.8
b.	42.8	35.9	-6.9	41.7	37.2	-4.5
c.	29.4	31.2	1.8	26.1	29.8	3.7

5. NOT coming to a complete stop at a stop sign:

   a. Is illegal.
   b. Can cause an accident.
   c. Is extremely unsafe.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	55.2	53.5	-1.7	60.0	53.7	-6.3
b.	27.4	21.2	-6.2	20.6	19.7	-0.9
c.	16.9	24.7	7.8	19.4	26.1	6.7

6. People who get speeding tickets:

   a. Generally tend to drive more than people who don't.
   b. Tend to be unsafe drivers.
   c. Are the ones who cause most of the accidents.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	8.5	10.6	2.1	6.7	9.6	2.9
b.	44.3	52.9	8.6	51.7	54.3	2.6
c.	46.8	35.9	-10.9	41.1	35.6	-5.5

7. Driving in bad weather:

   a. Requires extra caution.
   b. Tends to be hazardous.
   c. Should always be avoided if possible.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	67.7	64.7	-3.0	78.9	73.9	-5.0
b.	4.5	4.1	-0.4	10.6	10.6	0.0
c.	27.9	31.2	3.3	10.6	14.4	3.8

8. Which is the truest statement concerning speed and safe driving:

a. To drive fast requires alertness.
b. The faster you drive, the greater your chances of having an accident.
c. People who speed cause most of the accidents.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	22.4	25.9	3.5	26.1	21.8	-4.3
b.	60.7	64.7	4.0	63.9	70.7	6.8
c.	16.9	9.4	-7.5	10.0	7.4	-2.6

9. Concerning drinking and driving:

a. You can drive safely if you are careful about the way you drink.
b. Just a small amount of alcohol can make you unsafe.
c. Never drive if you've had anything to drink.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	12.4	11.8	-0.6	22.2	18.6	-3.6
b.	20.9	28.2	7.3	32.8	43.6	10.8
c.	66.7	60.0	-6.7	44.4	36.7	-7.7

10. When passengers in a car become a nuisance, the best thing to do is:

a. Not let it distract you.
b. Tell them to stop it.
c. Pull to the curb and refuse to continue until they stop.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	25.4	21.8	-3.6	19.4	17.6	-1.8
b.	23.9	29.4	5.5	33.9	37.8	3.9
c.	50.7	48.8	-1.9	46.7	44.7	-2.0

11. If someone is "tailgating" you, the best thing to do is:

a. Tap your brakes a few times as a warning.
b. Slow down and make the tailgater pass.
c. Pull over and let him pass.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	10.0	21.8	11.8	28.9	31.9	3.0
b.	17.4	20.0	2.6	21.7	18.1	-3.6
c.	71.1	57.6	-13.5	48.3	49.5	1.2

12. When you come to kids playing by the side of the road, you should:

a. Sound your horn to let them know you are coming.
b. Pass them very slowly.
c. Sound your horn and wait until they stop playing before you continue.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	22.9	17.6	-5.3	33.9	29.3	-4.6
b.	29.4	31.2	1.8	50.0	48.4	-1.6
c.	46.8	51.2	4.4	16.1	22.3	6.2

13. You are passing a car on a two lane road. As you pull alongside, you see a truck in the distance. You should:

a. Complete the pass as quickly as possible.
b. Speed up or slow down depending upon what the other car does.
c. Slow down and drop back into lane.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	15.9	19.4	3.5	42.8	35.1	-7.7
b.	16.9	20.6	3.7	19.4	20.2	0.8
c.	66.7	58.8	-7.9	36.1	44.1	8.0

14. When waiting at a red light, you should:

a. Keep an eye on the light and be ready to move as soon as it turns green.
b. Keep an eye on cross traffic and move out when you notice the light has changed.
c. Wait until traffic stops completely before you start to move out.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	12.9	8.2	-4.7	11.1	6.9	-4.2
b.	27.9	25.9	-2.0	27.2	22.3	-4.9
c.	58.7	65.3	6.6	60.6	70.7	10.1

15. The best frame of mind for good driving is:

a. Relaxed.
b. Confident.
c. Wary.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	51.7	51.8	0.1	57.2	59.0	1.8
b.	34.8	35.9	1.1	36.7	35.1	-1.6
c.	12.4	12.4	0.0	5.6	5.9	0.3

16. If you are driving a small car, you should leave a following distance that is:

a. Shorter than if you were driving a full size car.
b. The same as if you were driving a full size car.
c. Longer than if you were driving a full size car.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	10.0	11.8	1.8	8.9	12.8	3.9
b.	79.1	76.5	-2.6	80.6	76.1	-4.5
c.	10.4	11.8	1.4	10.0	11.2	1.2

17. The best driver is one who:

a. Minds his own driving and lets others worry about theirs.
b. Gives others credit for being safe drivers.
c. Assumes that others are basically unsafe drivers.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	38.3	28.2	-10.1	30.0	22.9	-7.1
b.	18.4	22.9	4.5	19.4	23.9	4.5
c.	42.8	48.2	5.4	50.6	52.1	1.5

18. Having an accident:

a. Is something that happens to every one sooner or later.
b. Means your driving could stand improvement
c. Is a sure sign of unsafe driving.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	19.9	20.0	0.1	28.3	34.6	6.3
b.	59.7	67.6	7.9	56.1	55.9	-0.2
c.	19.9	12.4	-7.5	14.4	9.6	-4.8

19. Which is the truest statement concerning speed and safe driving:

a. To drive fast requires alertness.
b. Driving fast increases the chances of an accident.
c. Driving too fast is a major cause of accidents.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	15.4	20.6	5.2	22.8	22.3	-0.5
b.	50.7	56.5	5.8	51.1	60.1	9.0
c.	33.8	22.9	-10.9	26.1	17.6	-8.5

20. Driving 12 hours in one day:

a. Is safe if you are well rested.
b. Is not a good idea if you can help it.
c. Is asking for trouble.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	26.9	21.2	-5.7	29.4	28.7	-0.7
b.	60.2	65.9	5.7	56.1	56.4	0.3
c.	12.9	12.9	0.0	13.9	14.4	0.5

On this part of the test, there are no right or wrong answers. Read the statements below and pick one of the following words that best says how you feel about the statement:

A. Always
B. Usually
C. Sometimes
D. Rarely
E. Never

Fill in the space on your answer sheet that corresponds to the word you have chosen to fill in the blanks in the statements below.

21. I feel that young people are _____ much better drivers than are middle-aged people.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	2.5	1.8	-0.7	0.0	3.2	3.2
b.	10.0	13.5	3.5	13.3	13.3	0.0
c.	67.2	67.1	-0.1	62.2	68.1	5.9
d.	16.4	15.3	-1.1	22.2	13.8	-8.4
e.	3.5	2.4	-1.1	2.2	1.6	-0.6

22. I feel that policemen are _____ sincere in enforcing traffic laws.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	17.4	14.1	-3.3	23.3	16.0	-7.3
b.	56.2	58.8	2.6	49.4	45.7	-3.7
c.	17.9	21.8	3.9	16.7	26.1	9.4
d.	6.5	4.7	-1.8	6.7	11.2	4.5
e.	2.0	0.6	-1.4	3.3	1.1	-2.2

23. I _____ feel full of pep when I get behind the wheel.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	30.3	18.2	-12.1	36.1	25.5	-10.6
b.	32.3	31.8	-0.5	31.1	37.2	6.1
c.	23.4	30.6	7.2	18.3	21.8	3.5
d.	6.5	10.0	3.5	7.8	8.5	0.7
e.	6.5	9.4	2.9	6.7	6.9	0.2

24. If I see a police officer, I am _____ more careful.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	60.7	57.1	-3.6	57.2	48.9	-8.3
b.	29.4	28.2	-1.2	32.2	33.5	1.3
c.	5.0	8.2	3.2	8.3	12.2	3.9
d.	4.5	4.7	0.2	1.1	3.2	2.1
e.	0.5	1.8	1.3	1.1	2.1	1.0

25. Over-careful drivers _____ cause more accidents than the so-called reckless ones.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	1.0	4.1	3.1	3.3	4.3	1.0
b.	12.4	8.8	-3.6	14.4	19.1	4.7
c.	40.8	54.1	13.3	52.2	53.7	1.5
d.	32.3	24.7	-7.6	22.8	19.7	-3.1
e.	12.9	8.2	-4.7	7.2	3.2	-4.0

26. I _____ get a feeling of real power when driving a car.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	9.0	5.9	-3.1	10.0	10.6	0.6
b.	15.9	14.7	-1.2	15.0	13.3	-1.7
c.	27.9	33.5	5.6	25.0	33.5	8.5
d.	25.4	28.2	2.8	30.0	26.1	-3.9
e.	20.4	17.6	-2.8	19.4	16.5	-2.9

27. I _____ feel that slow drivers should be kept off the highways.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	12.4	11.8	-0.6	18.3	11.7	-6.6
b.	11.9	15.9	4.0	14.4	17.6	3.2
c.	45.8	50.6	4.8	44.4	51.6	7.2
d.	16.4	15.3	-1.1	15.0	9.6	-5.4
e.	13.4	6.5	-6.9	7.8	9.6	1.8

28. New drivers should _____ be required to take a course in driver education.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	52.7	54.7	2.0	52.2	54.3	2.1
b.	21.9	20.0	-1.9	18.9	22.9	4.0
c.	19.4	18.2	-1.2	18.3	17.6	-0.7
d.	3.5	3.5	0.0	5.6	3.2	-2.4
e.	1.5	3.5	2.0	4.4	1.6	-2.8

29. I _____ feel that unsafe drivers should be deprived of the right to drive.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	38.8	40.0	1.2	33.3	23.9	-9.4
b.	18.9	20.0	1.1	22.8	20.7	-2.1
c.	24.9	30.0	5.1	31.1	37.2	6.1
d.	9.5	7.6	-1.9	7.2	12.2	5.0
e.	7.0	2.4	-4.6	5.0	5.9	0.9

30. I _____ feel that accidents (mishaps) don't just happen; they are caused.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	19.9	20.6	0.7	22.2	20.7	-1.5
b.	23.9	22.9	-1.0	17.8	22.3	4.5
c.	29.4	35.9	6.5	32.2	35.1	2.9
d.	14.4	11.2	-3.2	16.1	15.4	-0.7
e.	10.9	9.4	-1.5	11.1	6.4	-4.7

31. I _____ like to get everything out of a car that it has in it.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	11.4	12.4	1.0	16.1	12.2	-3.9
b.	15.9	11.2	-4.7	15.6	23.4	7.8
c.	21.9	18.2	-3.7	17.2	17.0	-0.2
d.	24.9	25.9	1.0	21.7	22.9	1.2
e.	24.9	31.8	6.9	28.9	23.4	-5.5

32. I _____ feel that the chief work of most policemen should be traffic control.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	10.9	6.5	-4.4	7.8	10.6	2.8
b.	12.4	12.9	0.5	16.1	14.9	-1.2
c.	33.3	40.6	7.3	25.0	31.9	6.9
d.	23.4	25.9	2.5	27.2	23.9	-3.3
e.	19.4	14.1	-5.3	22.8	18.6	-4.2

33. I _____ get impatient in heavy traffic.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	11.9	8.2	-3.7	8.9	12.2	3.3
b.	14.9	14.7	-0.2	17.8	20.2	2.4
c.	41.3	45.9	4.6	43.9	40.4	-3.5
d.	18.4	18.2	-0.2	20.0	16.0	-4.0
e.	12.9	12.4	-0.5	9.4	11.2	1.8

34. Old, defective cars should _____ be kept off the road.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	43.3	46.5	3.2	46.1	41.5	-4.6
b.	20.9	21.2	0.3	16.7	23.9	7.2
c.	21.9	25.9	4.0	22.8	25.5	2.7
d.	5.5	4.1	-1.4	7.2	5.3	-1.9
e.	8.5	2.4	-6.1	7.2	3.7	-3.5

35. I _____ feel that drivers should be given more freedom in obeying traffic signs.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	11.4	10.6	-0.8	13.3	14.4	1.1
b.	9.5	10.6	1.1	12.2	16.5	4.3
c.	25.9	22.9	-3.0	19.4	23.4	4.0
d.	20.4	26.5	6.1	21.1	18.6	-2.5
e.	32.3	28.8	3.5	32.8	27.1	-5.7

36. People should _____ drive when they are angry.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	2.0	0.0	-2.0	2.8	3.2	0.4
b.	1.0	3.5	2.5	0.0	2.7	2.7
c.	3.0	2.4	-0.6	3.3	6.4	3.1
d.	22.4	20.6	-1.8	18.3	10.6	-7.7
e.	69.7	70.0	0.3	72.8	74.5	1.7

37. Passing on hills and curves is _____ exceedingly dangerous.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	66.2	68.8	2.6	71.1	67.6	-3.5
b.	18.4	17.1	-1.3	15.6	16.0	0.4
c.	10.4	8.8	-1.6	9.4	10.6	1.2
d.	2.5	0.6	-1.9	1.1	1.6	0.5
e.	1.0	0.6	-0.4	1.7	2.1	0.4

38. It is _____ necessary to stop at "stop" signs if no other cars are in sight.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	79.6	78.8	-0.8	86.7	84.6	-2.1
b.	8.0	10.6	2.6	8.3	7.4	-0.9
c.	6.5	4.1	-2.4	2.2	2.7	0.5
d.	2.5	2.9	0.4	1.7	2.7	1.0
e.	1.5	0.0	-1.5	0.0	0.5	0.5

39. I _____ like to put extras on my car to attract attention.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	9.0	6.5	-2.5	8.9	6.9	-2.0
b.	8.5	7.1	-1.4	10.0	11.7	1.7
c.	27.9	31.8	3.9	29.4	33.0	3.6
d.	24.4	25.3	0.9	21.7	28.2	6.5
e.	26.4	25.3	-1.1	28.9	18.1	-10.8

40. I _____ feel that police officers are rougher on teenagers than on adults.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	23.4	21.8	-1.6	27.2	27.1	-0.1
b.	16.9	11.2	-5.7	22.8	22.9	0.1
c.	43.3	48.2	4.9	33.9	34.0	0.1
d.	9.0	11.8	2.8	10.6	10.6	0.0
e.	4.5	2.9	-1.6	3.9	3.2	-0.7

41. Society should _____ have the right to question the way I drive.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	28.9	27.1	-1.8	20.0	16.5	-3.5
b.	11.4	12.4	1.0	16.1	12.8	-3.3
c.	34.3	28.8	-5.5	32.8	35.6	2.8
d.	9.0	13.5	4.5	13.9	13.3	-0.6
e.	13.9	14.7	0.8	16.1	19.1	3.0

42. Attitudes toward driving are _____ more important than ability to handle a car.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	19.9	19.4	-0.5	23.9	17.6	-6.3
b.	17.4	22.4	5.0	17.8	26.1	8.3
c.	36.8	39.4	2.6	36.1	33.0	-3.1
d.	10.0	7.6	-2.4	10.6	11.7	1.1
e.	13.9	6.5	-7.4	10.6	9.6	-1.0

43. I _____ like to take chances when I'm driving.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	1.5	0.6	-0.9	1.7	2.1	0.4
b.	1.5	2.4	0.9	2.8	6.4	3.6
c.	5.0	2.9	-2.1	4.4	11.2	6.8
d.	20.4	20.6	0.2	22.8	14.4	-8.4
e.	69.7	69.4	-0.3	67.2	63.8	-3.4

44. I _____ feel that traffic laws are set up to promote safety.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	65.7	66.5	0.8	58.3	53.7	-4.6
b.	18.4	22.9	4.5	25.0	29.8	4.8
c.	7.0	5.3	-1.7	8.3	11.2	2.9
d.	2.0	0.6	-1.4	3.9	1.6	-2.3
e.	5.0	0.6	-4.4	3.3	1.6	-1.7

45. Courtesy toward other drivers is _____ important.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	71.1	71.8	0.7	77.2	69.7	-7.5
b.	16.4	15.3	-1.1	12.2	13.3	1.1
c.	9.5	8.8	-0.7	6.7	10.1	3.4
d.	1.0	0.6	-0.4	1.7	2.7	1.0
e.	0.0	0.0	0.0	1.1	2.1	1.0

46. I _____ feel somewhat nervous when I drive a car.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	9.5	6.5	-3.0	8.3	5.3	-3.0
b.	9.5	15.3	5.8	13.9	9.6	-4.3
c.	44.3	42.4	-1.9	39.4	38.8	-0.6
d.	21.4	21.8	0.4	22.8	30.3	7.5
e.	12.9	10.0	-2.9	14.4	13.8	-0.6

47. I _____ get more fun out of driving a car than in any other activity.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	13.4	12.4	-1.0	15.0	19.1	4.1
b.	21.4	17.1	-4.3	16.7	19.7	3.0
c.	40.4	45.3	5.0	47.8	35.6	-12.2
d.	16.9	14.7	-2.2	15.6	17.6	2.0
e.	4.5	7.1	2.6	3.9	5.9	2.0

48. I _____ feel that I am more courteous than the average driver.

	PDL			SPC		
	Pre	Post	Post-Pre	Pre	Post	Post-Pre
a.	9.5	12.9	3.4	12.2	12.2	0.0
b.	30.8	25.9	-4.9	22.2	26.6	4.4
c.	39.8	41.8	2.0	45.6	45.2	-0.4
d.	11.4	8.2	-3.2	11.7	9.6	-2.1
e.	5.0	6.5	1.5	7.2	3.7	-3.5

Appendix H

DRIVING KNOWLEDGE TEST

Item Correlations

	FORM AB	FORM BA
Basic Control Tasks		
1	0.30	0.41
2	0.43	0.48
26	0.51	0.20
27	0.42	0.45
Normal Driving		
3	0.34	0.28
4	0.19	0.35
5	0.10	0.40
6	0.26	0.38
7	0.34	0.38
8	0.16	0.26
9	0.37	0.46
28	0.31	0.38
29	0.31	0.34
30	0.38	0.31
31	0.46	0.17
32	0.22	0.39
33	0.23	0.34
34	0.44	0.44
Environmental Factors		
10	0.40	0.15
11	0.42	0.37
12	0.32	0.35
13	0.22	0.26
14	0.16	0.28
35	0.23	0.34
36	0.40	0.38
37	0.30	0.41
38	0.36	0.42
39	0.18	0.19
Complex Perceptual Skills		
15	0.30	0.40
16	0.34	0.40
40	0.32	0.27
41	0.30	0.52

(Continued)

APPENDIX H *(Continued)*

DRIVING KNOWLEDGE TEST
Item Correlations

	FORM AB	FORM BA
Drivers Influences		
17	0.38	0.40
18	0.35	0.51
42	0.27	0.43
43	0.42	0.49
Emergency Skills		
19	0.35	0.19
20	0.20	0.41
21	0.34	0.45
22	0.29	0.24
44	0.38	0.38
45	0.43	0.13
46	0.36	0.55
47	0.39	0.39
Nonoperational Tasks		
23	0.32	0.35
24	0.40	0.46
25	0.24	0.24
48	0.31	0.42
49	0.32	0.41
50	0.25	0.33

Appendix I

SPC UNIT TEST RESULTS

Unit Test Results for SPC

Unit Test 3 (N=227)

Item #	Mean % Correct	Standard Deviation
1	0.24	0.429
2	0.72	0.448
3	0.75	0.431
4	0.89	0.313
5	0.37	0.482
6	0.78	0.417
7	0.82	0.385
8	0.59	0.491
9	0.34	0.475
10	0.90	0.302
11	0.16	0.365
12	0.96	0.205
13	0.97	0.160
14	0.84	0.365
15	0.98	0.147
16	0.85	0.353
17	0.92	0.277

Unit Test 4 (N-221)

Item #	Mean % Correct	Standard Deviation
1	0.79	0.409
2	0.67	0.470
3	0.86	0.343
4	0.66	0.474
5	0.73	0.442
6	0.73	0.445
7	0.75	0.432
8	0.57	0.494
9	0.27	0.442
10	0.76	0.424

(Continued)

Appendix I *(Continued)*

APC UNIT TEST RESULTS

Unit Test 6 (N=194)

Item #	Mean % Correct	Standard Deviation
1		
1	0.62	0.486
2	0.63	0.482
3	0.52	0.500
4	0.49	0.500
5	0.34	0.472
6	0.39	0.488
7	0.84	0.366
8	0.95	0.210
9	0.91	0.283
10	0.73	0.443

Unit Test 7 (N=190)

Item #	Mean % Correct	Standard Deviation
1	0.72	0.449
2	0.42	0.494
3	0.78	0.415
4	0.64	0.481
5	0.71	0.456
6	0.57	0.495
7	0.62	0.486
8	0.61	0.489
9	0.93	0.261
10	0.53	0.499

Unit Test 8 (N=188)

Item #	Mean % Correct	Standard Deviation
1	0.20	0.402
2	0.59	0.492
3	0.12	0.328
4	0.54	0.499
5	0.83	0.376
6	0.30	0.460
7	0.51	0.500
8	0.74	0.439
9	0.93	0.263
10	0.99	0.103

Appendix J

BASIC SKILLS RANGE TEST
Analysis of Variance Source Tables

PRESTART/START

Source	SS	df	MS	F
Curr	3.893	1	3.893	10.426*
Level	1.978	1	1.978	5.297
Sex	.077	1	.077	-
C x L	.246	1	.246	-
C x S	.003	1	.003	-
L x S	.039	1	.039	-
C x L x S	.023	1	.023	-
Within	155.705	417	.373	

ACCELERATING/STOPPING

Source	SS	df	MS	F
Curr	.589	1	.589	-
Level	.001	1	.001	-
Sex	1.700	1	1.700	2.776
C x L	.297	1	.297	-
C x S	.054	1	.054	-
L x S	.362	1	.362	-
C x L x S	.324	1	.328	-
Within	255.341	417	.612	

MAINTAINING DIRECTION

Source	SS	df	MS	F
Curr	3.614	1	3.614	4.733
Level	.160	1	.160	-
Sex	.062	1	.062	-
C x L	.003	1	.003	-
C x S	.016	1	.016	-
L x S	.483	1	.483	-
C x L x S	.040	1	.040	-
Within	318.422	417	.764	

(Continued)

*Significant at .01 level

Appendix J *(Continued)*

BASIC SKILLS RANGE TEST
Analysis of Variance Source Tables

TURN LEFT

Source	SS	df	MS	F
Curr	3.307	1	3.307	4.526
Level	1.168	1	1.168	1.598
Sex	5.012	1	5.012	6.859
C x L	.086	1	.086	-
C x S	.473	1	.473	-
L x S	2.882	1	2.882	3.944
C x L x S	.023	1	.023	-
Within	304.714	417	.731	

TURN RIGHT

Source	SS	df	MS	F
Curr	5.223	1	5.223	5.362
Level	.079	1	.079	-
Sex	4.013	1	4.013	4.119
C x L	.519	1	.519	-
C x S	.663	1	.663	-
L x S	3.600	1	3.600	3.695
C x L x S	.009	1	.009	-
Within	406.226	417	.974	

LANE CHANGE RIGHT

Source	SS	df	MS	F
Curr	27.495	1	27.495	10.525*
Level	2.263	1	2.263	-
Sex	11.888	1	11.888	4.551*
C x L	.568	1	.568	-
C x S	.004	1	.004	-
L x S	7.794	1	7.794	2.983
C x L x S	.508	1	.508	
Within	1,089.392	417	2.612	

(Continued)

*Significant at .01 level

Appendix J *(Continued)*

BASIC SKILLS RANGE TEST
Analysis of Variance Source Tables

LANE CHANGE LEFT

Source	SS	df	MS	F
Curr	1.862	1	1.862	-
Level	2.734	1	2.734	1.044
Sex	.894	1	.894	-
C x L	2.684	1	2,684	1,025
C x S	.881	1	.881	-
L x S	.005	1	.005	-
C x L x S	.401	1	.401	-
Within	1,091.517	417	2.618	

Appendix K

PROJECT STAFFING REQUIREMENTS

The project was staffed with an on-site project director, a curriculum administrator, eight research instructors, and three project aides (one aide was used "as needed").[1]

The project director was responsible for management, administration and supervision of on-site implementation activities. The curriculum administrator, in addition to his duties as instructional staff supervisor, provided administrative assistance to the project director.

Directly responsible for the implementation of the Safe Performance Curriculum pilot test were the eight research instructors. The instructors formed two teams of four, each headed by a team leader. The team leader was responsible for supervision of the instructors and para-professionals assigned to his team. (Para-professionals served as project aides.[2] The research program was conducted at three schools. For the Spring semester, both teams taught one hour each morning at Site A, then one team taught four hours in the afternoon at Site B, and the other team taught four hours in the afternoon at Site C.

The on-site personnel diagram on the following page and the job description narratives which follow it provide additional information concerning the requirements for on-site staffing.

The Project Director was responsible for management, administration and supervision of the project staff. Duties included the following: supervision of teacher training, guidance and evaluation; data collection and analysis; recruitment and hiring of staff; maintenance and management of equipment and facilities associated with the project; and preparation of monthly progress reports covering both technical and financial affairs.

The Curriculum Administrator was responsible for the daily administration of the on-site implementation of the project. Specific tasks and responsibilities included: coordination of in-service teacher training; supervision of para-professionals; management and coordination of teams and team leaders; substituting for teachers and for para-professionals as needed; supervision of security for project facilities and equipment; and general supervision of both curricula.

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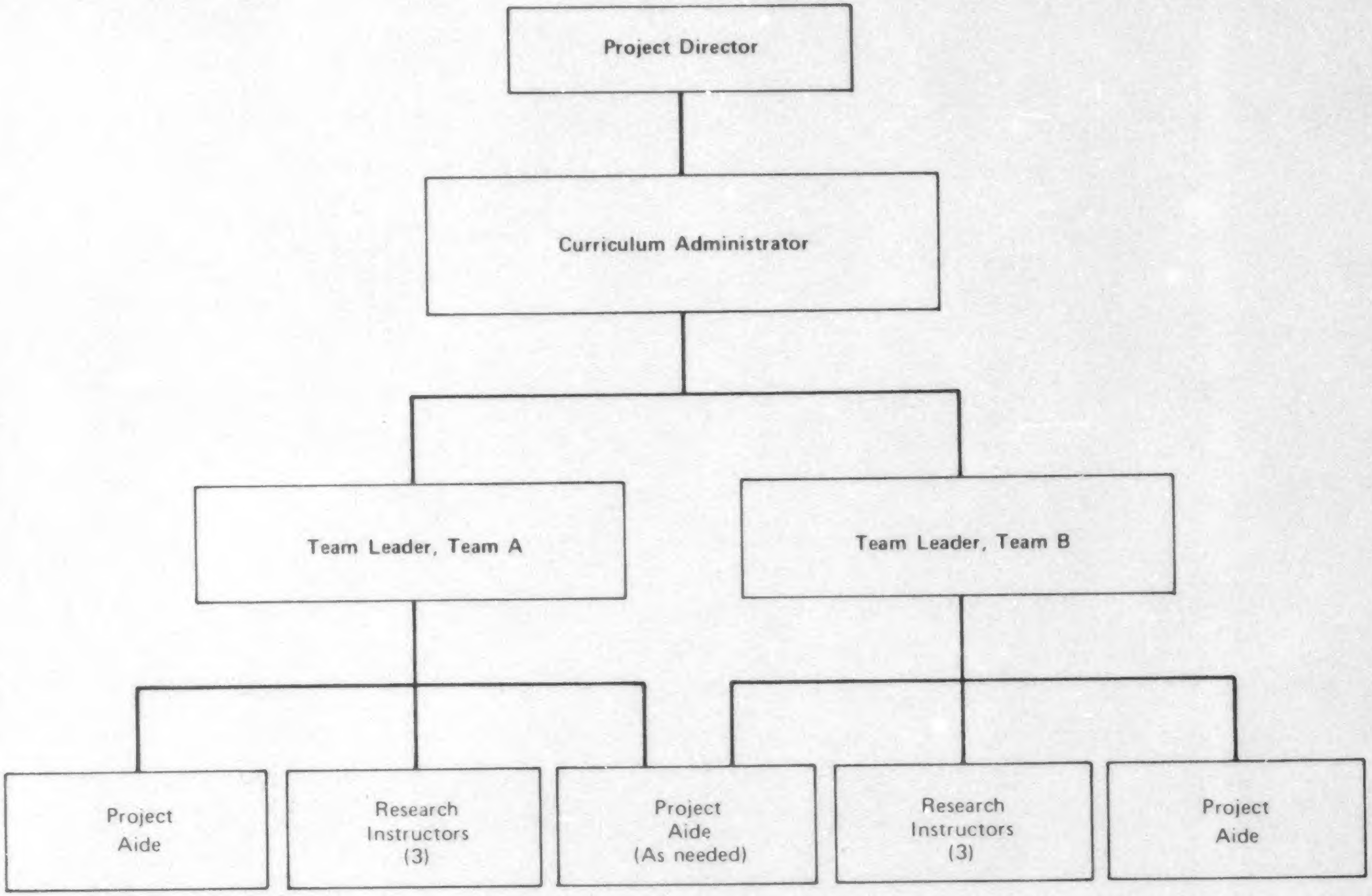
[1] In some cases, the schedule called for ten instructors (five at each pilot test school). When this occurred, substitute teachers from Central Missouri State University, the subcontractor for this project, were used.

[2] Experience with the project has shown that research instructors were overburdened with non-teaching duties (e.g., shuttling cars, setting up and taking down ranges, etc.); thus the use of project aides.

On-Site Personnel



The Team Leaders were responsible for providing organizational leadership for the instructional teams. Specific responsibilities included: conducting planning and operational meetings for the teams; coordinating the teaching schedule for their school; scheduling the Instructional Assistant and the Project Aide(s) where applicable; serving as the liaison with the high school administration; maintaining a current inventory of equipment and supplies assigned to their teaching location; acting as liaison with teaching staff supervisory personnel and project staff; coordinating all team reports and grades for the school, the district and the project as requested; and conferring with the Curriculum Administrator concerning project supplies and curricula needs. In addition to providing organizational leadership, the Team Leader had primary responsibility for the structuring of Guided Learning activities. The more specific responsibilities related to the area of Guided Learning were: seeing that student progress charts were being used and constantly being updated; noting possible changes in the progress charts which could add to accuracy as well as efficiency; using instructor input toward developing the most effective learning program for a specific student; coordinating long-range projects; and conferring with the Curriculum Administrator concerning any or all of the above areas.

The Research Instructors were responsible for providing instruction to the high school youth assigned to the project and for meeting the objectives of both the Safe Performance and Pre-Driver Licensing Curricula. Specifically, this includes classroom, simulation, multiple-vehicle range and on-street instruction, out-of-class activities and guided learning activity coordination. Other responsibilities included: administration of knowledge and performance measures and collection of data related to test administration; maintenance of student progress and attendance records; within-team discussion of student progress and determination of student activities dependent upon student ability and need; design of guided learning activities to answer student deficiencies; consultation with instructor training consultants on teaching techniques and teaching competencies; submission of reports and final grades to the local school and to the Project Director; attendance of in-service meetings in addition to regular staff meetings; and the proficient use of project equipment, facilities and supplies.

Qualifications for instructors are discussed in detail in the Technical Findings report prepared under this contract. In general, the following recommendations were made:

> Instructors should have an extensive background in driver education, particularly in the areas of range and on-street instruction.
>
> Instructors should know how to conduct multimedia and simulator sessions. This involves understanding the lesson objectives and subsequently matching objectives with the film content; monitoring student feedback; tabulating scores; and evaluating responses.
>
> Instructors must have the capability to "individualize" instruction--that is, to monitor the progress of each student throughout each of the modes of the Safe Performance Curriculum and to ensure, through the most

efficient means, that the learning needs of each student are matched with the appropriate educational resource.

The Project Aide was responsible for performing multiple tasks which included: chauffeuring students when needed, keeping range vehicles operational, assisting in range set-up and break-down, running project errands, assisting with clerical duties, keeping vehicles and range areas clean and gassing project vehicles. The Project Aide also performed a variety of additional duties as assigned by the Team Leader or by the Curriculum Administrator.